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COMPUTERWORLD

Bank law to spur IS revamps

By Thomas Hoffman
and Mitch Betts

The U.S. Senate's approval last week of a long-awaited interstate banking bill is expected to accelerate the industry's already fast-paced merger and acquisition activity and expedite data center consolidations.

The legislation, which President Clinton is expected to sign into law shortly, would effectively remove all remaining barriers to interstate banking in the U.S. beginning late next year.

"From a systems standpoint, the biggest impact for us will be on our item processing," said Judge Fowler, senior vice president and director of systems development at First Union Corp. in Charlotte, N.C.

Fowler said the new interstate banking law — which for the first time will allow customers to make deposits to their accounts from branches in different states — will require First Union to upgrade 20 of its older IBM 3890 XP reader/sorters at an anticipated cost of

Bank law, *page 127*

NT honed for Unix fight

Microsoft partners strengthen high-end server push

By Stuart J. Johnston
and Jean S. Bozman

When Microsoft Corp. this week unveils the Daytona version of Windows NT and a slew of accompanying server and applications products, what goes unsaid may be more important than what happens onstage.

Although it never intended to keep it a secret, Microsoft has quietly assembled a panoply of partners to provide connectivity options for the Unix environments that are central to many enterprise computing networks.

While each of these alliances is important individually, when viewed in toto they add up to nothing short of an all-out assault on the bastions of Unix.



BackOffice, Microsoft's suite of server products for corporate users, will include four server applications that run on NT Advanced Server. The package will debut at Networks Expo this week.

"I don't think anybody has said, 'Look how all these things add up,'" said Jesse Berst, editorial director of the "Windows Watcher" industry newsletter in Redmond, Wash.

Alliance leverage

In part, via these partnerships, Microsoft hopes Daytona — or Windows NT 3.5, which is scheduled to ship in the next few weeks — will provide a wedge to move NT into the critical high-end server market.

However, it will take more than an interim update — with features

NT, *page 16*

Novell bids to regain momentum

By Elisabeth Horwitt

Just how late in the game is it for Novell, Inc.?

Customers and analysts are wondering if Chief Executive Officer and Chairman Robert Frankenberg can provide the strategy and the products to convince key corporate customers that Novell, rather than Microsoft Corp., is the best horse to ride into their client/server future.

Novell is considering whether to port NetWare Directory Services to other platforms, including other vendors' Unix systems and NT.

Novell watchers so far seem to agree on two things: Frankenberg is up against some serious challenges, and he is the right man to take them on.

Novell's history has in many ways been the classic business blunder. Founder Raymond Noorda turned a tiny, insignificant player into the leading network operating system company. But then he took about three years longer than was advisable to step down.

In the process, analysts said, the founder made some ill-advised decisions that spread Novell's resources in too many directions and caused it to lose focus and miss some key dead-

Novell, *page 16*

Users await database price relief

By Kim S. Nash
and Thomas Hoffman

Database users are smelling bargains as competitive pressures force Oracle Corp., Sybase, Inc. and others to wheel and deal for new business.

Deep discounting announced by Microsoft Corp. — and more recently, Computer Associates International, Inc. — is likely to compel market leaders Oracle and Sybase to respond in kind, according to 10 users and analysts interviewed.

"It's getting stickier by the day for these guys to maintain the premium pricing they're used to," said Cory Isaacson, president of CompuFlex International, Inc., a third-party applications firm in Woodland Hills, Calif.

One sign that database heavyweights are bending to price pres-

Price relief, *page 127*

One-upmanship

As bargains begin to appear, would-be database customers would be wise to shop around before committing to one vendor

Database	Typical price per user
CA-OpenIngres Success Pack*	$500
IBM DB2/2	$425
Informix OnLine	$900 to $1,200
Microsoft SQL Server	As low as $150
Oracle 7	$680 to $1,200
Sybase System 10	Not offered

*Includes development tools as well as database

Sources: Industry analysts, database firms

Client/Server
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FIRING:
You'll have to do it.
HIRING:
Talent ain't cheap.
GAMBLING:
You'll roll dice on unknown vendors.
Four IS execs speak out.
See In Depth, page 91

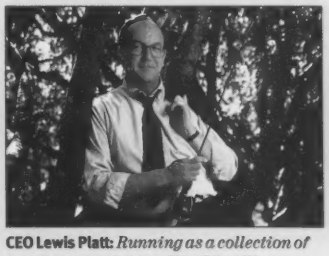
HP learned lessons well

By Jean S. Bozman
PALO ALTO, CALIF.

Hewlett-Packard Co. is sailing on calm seas these days, its profits surging while competitors IBM and Digital Equipment Corp. struggle to right their corporate ships following recent reorganizations.

As users prepare to attend Interex, the HP user conference in Denver this week, many customers said the company has learned how to pamper its installed base.

With products targeted at the hot markets of PCs, desktop printers and enterprise servers, HP saw profits grow to $347 million in its third quarter, which ended July 31. Its revenue has more than doubled since 1988,



CEO Lewis Platt: *Running as a collection of small companies is critical for HP*

and some of its businesses are growing at rates of 50% or more (see story page 28).

But the $20 billion diversified electronics firm has an institutional memory like an elephant: Its top executives are ever mindful of its crises in the mid-1980s and early 1990s. They plan to head off similar trouble by spotting it early.

"I think there's a sort of healthy paranoia that runs around inside of HP," said Lewis Platt, who replaced John Young as chief ex-

Hewlett-Packard, *page 28*

Newspaper

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What's Inside

September 19, 1994



Viewpoint

The picture isn't pretty when a CEO looks at information functions. CA Chairman Charles B. Wang (left) examined technology use for his new book. He found high levels of frustration on the part of CEOs dealing with a technology disconnect and says the CEO and CIO have to rethink the CIO's role.

See Page 37

NEWS

■ **Microsoft** promotes the networking capabilities of NT. *Page 2*

■ IBM will ship its long-awaited **PowerPC-based** desktop systems on a limited basis, giving its often-delayed version of OS/2 for those systems time to catch up. *Page 4*

■ Lotus announces a cheaper, lower-function version of **Notes**, upsetting part of its installed base. *Page 2*

■ October will see **IBM** trying to revive its server business and announcing new notebooks and a new desktop strategy. *Page 6*

■ MCI introduces a Windows software product bundled with a **multimedia**, public network service. *Page 8*

■ Software 2000 readies object-oriented applications supporting client/server installations with IBM's **AS/400**. *Page 10*

■ At **Networld/Interop '94**, Cisco targets the remote-access market with 15 new products and an umbrella strategy. *Page 12*

■ Microsoft reveals the structure of its **Systems Management Server**, previously known as Hermes. *Page 14*

■ Multitasking **digital signal processors** could give users new, easier ways to add features to their systems. *Page 20*

COMPUTER INDUSTRY

■ **Cray Research** temporarily suspends most of its manufacturing while it retools to reduce turnaround times on systems. *Page 32*

DESKTOP COMPUTING

■ **D&B Software** plans to unbundle SmartStream desktop functions. *Page 43*

WORKGROUP COMPUTING

■ Sun's **Wabi** Windows-on-Unix application interface is being revised for the second time. *Page 49*

ENTERPRISE NETWORKING

■ First Virtual rolls out products to push **multimedia** to the desktop via low-cost ATM. *Page 61*

LARGE SYSTEMS

■ **SAS** rounds out data access options. *Page 69*

APPLICATION DEVELOPMENT

■ **Sybase** wipes out its old-fashioned, one-size-fits-all support program. *Page 79*

IN DEPTH

■ Four CIOs recall the trials and tribulations of developing and managing **client/server** applications. The big issues: database performance, retraining mainframe staffers, firing those who don't make the cut and convincing management it's safe to bet the company on a tiny software vendor. *Page 91*

CAREERS

■ It's time to get acquainted with **wireless LANs**. Fifty-seven percent of the companies surveyed plan to implement the technology eventually. *Page 99*

MARKETPLACE

■ **Network outsourcing** can work, but don't expect a perfect match at first. It takes time to find a vendor you can live with. *Page 110*

COMMENTARY

■ **Charles Babcock** views Digital's Alpha chips as technology leaders that have to overcome Digital's business difficulties. *Page 6*

■ **Paul Gillin** says the *Computerworld Premier 100* listing shows that business is going back to simpler values: Deliver quality at a fair price, and do more while spending less. *Page 36*

■ **Gary Law** says the seeming disarray in the network industry is actually a logical reaction to changes in users' needs. *Page 37*

The CW Premier 100

Computerworld's annual review of the U.S. leaders effectively using information technology is presented this week in a special publication mailed with the weekly *Computerworld* issue. To obtain additional copies of the *Premier 100* issue, call (800) 343-6474 and ask for the back issues department.

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Executive Briefing

Novell Chairman and CEO Robert Frankenberg has impressed customers and analysts alike by providing Novell with its first coherent product strategy in years, demonstrating a readiness to trim the organizational and product deadwood and avowing that Novell will stick to its NetWare knitting and not fritter away resources battling Microsoft in the desktop arena. *Cover 1*

U.S. Senate passage of interstate banking legislation could impact the IS operations and activities of regional and superregional banks by accelerating data center consolidations and cross-geographical standardization of branch applications. *Cover 1*

Hewlett-Packard sales are surging, even as computer competitors IBM and Digital work through recent reorganizations. Users and analysts say HP has been willing to learn from its mistakes to become more responsive to user requirements and cater to its installed user base to keep them on-line. *Cover 1*

Given the Internet's lack of security, intellectual property protection and ease of use, using the so-called information superhighway still presents daunting hurdles for many business users. *Page 24*

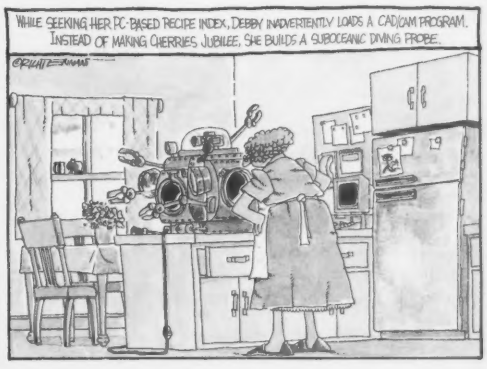
Investing $20 million, Boeing Commercial Airline Group, the world's biggest maker of commercial jetliners, will replace its homegrown legacy manufacturing system with a set of distributed, client/server packages from Baan USA. *Page 79*

Mere fad or truly fantastic? *Computerworld* readers review the latest objects of our information systems affections and share their views on which trends, products and technologies deserve to be tossed into the dustbin of history. *Page 83*

Users are getting more power on their servers as vendors push performance envelopes with multiprocessor Pentium PC architectures. But the question is, are customers willing to run the enterprise on such systems? *Page 49*

Microsoft seems to be thinking "enterprise" these days. It is preparing a bunch of server-based products in preparation for a showdown with Unix. *Page 1.* Meanwhile, Microsoft is touting the networking capabilities of NT and promoting the Systems Management Server product, formerly Hermes. *Pages 2 and 14.* On the service front, Microsoft is targeting large developer and corporate customers with changes in its support programs. *Pages 2 and 44.*

The 5th Wave *by* Rich Tennant



NT interoperability scores big at Interop

By Suruchi Mohan
ATLANTA

Microsoft Corp.'s Windows NT 3.5 may have established itself as a serious competitor to rival network operating systems at the Networld/Interop '94 conference here last week.

Skeptical users who came to the show expecting more marketing hype from Microsoft were pleasantly surprised when the company demonstrated the networking capabilities of Windows NT 3.5, codenamed Daytona, instead of presenting merely another slide show.

"The live presentation was unbelievable," said Doug Pruss, principal at CDS Tech Knowledge Ease, a business and technical training and development company in Atlanta. He said he was "very impressed that so many different servers and clients were accessible in real-time format. I saw 3.1 of NT in beta; [these] concepts were talked about."

Microsoft certainly touts this interoperability as one of its biggest strengths. Windows NT clients can access any of a host of servers, most notably Novell, Inc.'s NetWare, Unix, Banyan Systems, Inc.'s Vines and Digital Equipment Corp.'s Pathworks.

Indeed, Microsoft is aiming Daytona at large NetWare 3.x installations that are hesitant to make the migration to NetWare 4.x but want to add advanced networking features incrementally, said Dwayne Walker, general manager of solution sales and marketing.

Walker said the goal is not to replace NetWare 3.x with NT, but rather provide NT as an adjunct to NetWare 3.x installations. He said Daytona offers several advantages that NetWare 4.1 lacks. These include better remote connections via Microsoft's Remote Access Server (RAS), which is free with Daytona. And Daytona provides the most important advantage users get by migrating to NetWare Directory Services (NDS): the ability to have a single log-on and administration across multiple servers, Walker claimed.

Novell Chairman and Chief Executive Officer Bob Frankenberg disagreed. Daytona's Domain Directory lacks key NDS features, such as directory synchronization across domains and performance tuning, he said.

Heads turn

"We came here assuming we would go Novell but after the show are [now] extremely interested in NT," said David Kimble, a managing director at TEI Technology Enterprises, Inc., a management consulting firm in Cleveland.

"Initially, we blew off NT," said Walter Kuleck, a managing director at TEI. "We went from [NetWare] 3.11 to 4.01 and back to 3.12," he added. "Microsoft is offering a modular change in their software instead of [an] architectural [change] like Novell."

But NetWare users are not the only targets. In its attempt to be everything to everybody and to play up its theme of interconnectivity, Microsoft is providing native support for 32-bit TCP/IP, 32-bit IPX/SPX, Apple Computer, Inc.'s AppleTalk and, of course, its own NetBEUI.

Although users are not sure what to expect from 32-bit TCP/IP or Dynamic Host Control Protocol, which automatically configures the Internet Protocol host, they said they are happy about native TCP/IP support.

"A strong selling feature [of NT] is support of TCP/IP," said David Thompson, manager of operations at the Ministry of Environment in Victoria, British Columbia. He said he wants to consolidate his three protocols to one — TCP/IP.

Also, AppleTalk support in NT could make his life easier than Macintosh support on NetWare, which comes as a NetWare Loadable Module and needs additional support and administration, Thompson said.

Additionally, as part of Daytona, Microsoft is offering its RAS, which supports remote connections over a variety of dial-up protocols, including Basic Rate Interface Integrated Services Digital Network (ISDN) (128K bit/sec.). This is of extreme importance to companies trying to transfer large files to distant locations. Novell claims to be adding ISDN and other services to its NetWare Connect product next year (see story page 4).

David Meunier, president of Cascade Computer Technologies, a health care consultancy in Tacoma, Wash., said NT's ability to handle large files and send them over large areas will be a major factor when he selects an operating system for the hospitals his company serves.

Trust is lacking

But despite the optimism, users are still wary from past experiences with Microsoft's strategy. "They've been promising Chicago for 1½ years now," said Shankar Lakshman, a software development engineer at Wandel & Goltermann, an electronic measurement technology company in Research Triangle Park, N.C.

Although Ty Carlson, program manager for Windows NT at Microsoft, said the product has been released to manufacturers, he would not give the shipping date except to say it would be announced at Windows World in Dallas this week.

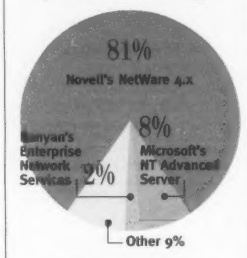
Also, pricing was not announced at Networld/Interop '94 and is expected at Windows World. For some users, pricing could be the deciding factor.

For Dan Cox, systems engineer at Rockwell International Corp. at the Kennedy Space Center in Florida, it is. "If 32-bit [architecture] makes my network faster, it helps. The question is, 'How much will it cost?' "

Senior editor Elisabeth Horwitt contributed to this article.

Lion's share

Which of the following are you more likely to make the basis of your client/server strategy?



BASE: 209 NOVELL USERS

Source: *Computerworld* Database Division, Framingham, Mass.

Notes Express elicits mixed reviews

By Lynda Radosevich

■ Reversing its previous public declarations, Lotus Development Corp. last week announced a cheaper, lower function version of its groupware software, named Notes Express. In the process, Lotus drew an angry response from at least part of its installed base.

As announced at Networld/Interop '94 in Atlanta last week, Notes Express is a subset of Notes that includes Notes electronic mail, group discussion databases, news feed, reference information databases and shared phone books. It costs $99, but most LAN E-mail users can purchase it for $60 per user through an incentive program. Full Notes is listed at $495 and costs roughly $330 per user with bulk discounts.

What is missing is the Notes application development capabilities. Also, Notes Express is limited to running the applications provided. In short, it is not a runtime version that Notes sites can distribute to users to access customized applications.

The announcement drew critical response from at least two sectors of the Lotus customer base. Reaction broke down as follows:

- Classic user angst from CC:Mail users who worried that their needs will be deprioritized as Lotus pushes Notes and Notes Express as its strategic high-end and low-priced messaging and groupware product line, respectively.
- Anger from some Notes users because Notes Express is not a runtime version.
- Enthusiasm from other Notes sites already committed to wide-scale deployment and from companies that want to experiment with the groupware platform at a lower cost.

Gulf Canada Resources Ltd., an oil exploration and production company in Calgary, Alberta, has 1,200 CC:Mail users and 100 Notes users. The frustration expressed by Bob Stratton, technical adviser at Gulf, summarized the response of several Lotus customers contacted last week.

"Personally, I can't think of a more useless waste of time. I was looking for a runtime version at a much lower price that would run everything we developed in Notes but would not give end users the Notes development capabilities," he said.

On the E-mail front, Stratton said if Lotus did not clarify its Notes vs. CC:Mail message and deliver on CC:Mail updates, he would move to Microsoft Corp.'s Mail.

Lotus officials said the company would not ignore its CC:Mail base, which at 5 million is more than five times the Notes installed base. Notes Express is simply an early edition of one of the CC:Mail/Notes integration products promised last September, they said.

Those products include the Lotus Communications Server (LCS), which is meant to help integrate the very different Notes and CC:Mail back ends. Also, Client/Server CC:Mail was to be the new E-mail client that worked with LCS. Together, the products were designed to give CC:Mail users a strategic upgrade path to client/server messaging based on Notes.

Although Notes Express uses the Notes E-mail interface now, both Notes and Notes Express E-mail will be updated in the LCS time frame to look like CC:Mail. So if CC:Mail users begin switching to Notes with the help of LCS, at least they will not have to retrain users on how to use the E-mail part of Notes, Lotus said.

Sound confusing? It is, CC:Mail users said, and that is part of the concern. Spurring their worries was admission from Lotus that the LCS is still a year from delivery.

Among the enthusiastic users were sites that had halted plans for big Notes rollouts because of high software costs.

Notes Express "will speed up [a sizable rollout], take a bite out of the financial costs and give us the ability to upgrade incrementally," said Gary Lasko, director of information technology at insurance broker Sedgwick, Inc.'s North American operations in Memphis.

groupware

Taking full advantage

Third-party developers can access the program via the Notes API. That will let them write applications with Visual Basic and other tools that use the Notes object stores. Also, Notes Express includes the ability to "switch on" full Notes capabilities for an extra $250. Users first must upgrade the Notes Express server to Notes 3.2.

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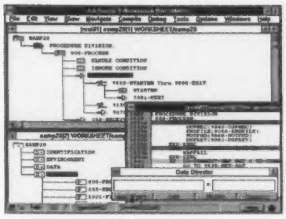


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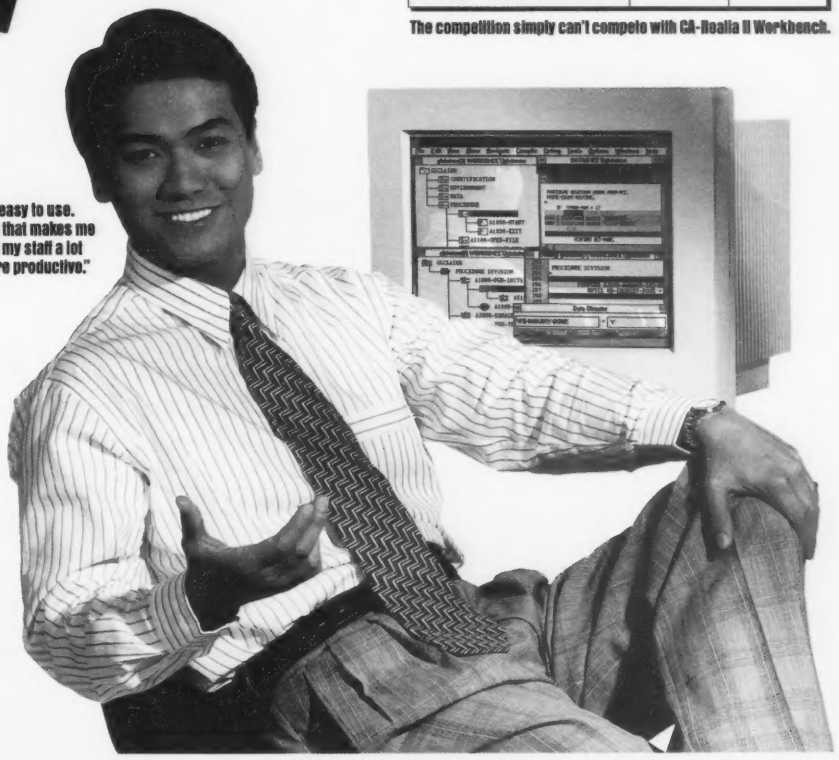
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Divided camps move closer to agreement

IBM PowerPCs to become available next month

By Ed Scannell and Michael Fitzgerald

After months of fence-sitting, IBM will finally announce availability of its PowerPC-based systems next month — but only on a special-bid basis, sources close to the company said.

"We're taking a phased roll-out approach to our introduction of PowerPC-based PCs," a spokesman said.

On Oct. 17, IBM will ship three products: the IBM PC PowerSeries 440, a PowerPC 601-based desktop; the PowerSeries 640, a 603-based desktop; and the ThinkPad PowerSeries 850, a 603-based notebook, sources said. General availability is targeted for late March or early April, the sources said, but IBM would confirm only a target of sometime in the first half.

IBM said this will buy more time for IBM's Personal Software Products group and other vendors to develop software. OS/2 for PowerPC, delayed twice, is not expected to be available until mid-June 1995. In the meantime, IBM will offer its AIX operating system along with a version of Microsoft Corp.'s Windows NT.

IBM confirmed it has already shipped "several hundred" PowerPCs on this special-bid basis, mostly to universities, developers and large corporate users.

Some users, however, said they were somewhat disappointed by the special-bid decision given that the price/performance of the machines cannot be specifically compared to Intel Corp.-based systems.



Uneasy feelings

Also, the lack of fully exploitive applications, or knowledge of how well existing software will run under OS/2 for PowerPC, has made users hesitant to commit to the upcoming systems.

Jonathan Handler, a senior consultant at the Blue Cross/Blue Shield Association in Chicago, said, "The association is not making any buying decisions about PowerPC. We need an operating system and applications for it." He added that he was encouraged to hear that many OS/2 independent software vendors intend to port their applications to PowerPC.

Senior editor Ellis Booker contributed to this story.

Apple works toward adoption of Prep standard

By Mark Halper

Apple Computer, Inc. confirmed last week that it continues to work toward bringing its Power Macintosh in line with the PowerPC Reference Platform (Prep) pushed by IBM and Motorola, Inc.

However, the Prep standard that IBM is following is so incongruent with Apple's operating system that "it would take about two years for us to port the Mac [operating system] to the current spec," said Don Strickland, Apple's vice president of licensing.

Apple already plans to adapt one Prep standard element by replacing its NuBus system bus with the Peripheral Component Interconnect bus. Strickland said the company is considering other hardware changes and hopes Prep "will evolve to have more features friendly with the Macintosh."

The IBM and Apple approaches differ on a number of fronts, ranging from the way printers and keyboards are connected to the ability to build IBM machines from off-the-shelf application-specific integrated circuits (ASIC) while Apple requires custom ASICs.

Strickland also said last week that Apple plans to license its operating system to computer vendors that are strong in markets where Apple does not have a significant presence. Those will include foreign countries and could also include niche markets in the U.S., he said.

Apple hopes that licensing will increase unit sales of Macintosh-compatible machines by 25% to 30% a year over the next two to three years, he said.

Novell hits back at NT 3.5 with additional features

By Elisabeth Horwitt

ATLANTA

Novell, Inc. is preparing to strike back next year against Microsoft Corp.'s networking push with Daytona (Windows NT 3.5). But first, it must correct some shortcomings.

During the fallow period in which former Chairman Raymond Noorda was preparing to step down, a virtually leaderless Novell slipped in several key connectivity areas where it once led its network operating system rivals, according to Rick Villars, an analyst at International Data Corp. in Framingham, Mass.

It is particularly weak in providing TCP/IP connectivity to Unix servers and Internet services, Villars said. For instance, where Daytona offers full TCP/IP support, Novell has "cobbled together support" of TCP/IP, according to Joe Schwartz, a consulting engineer at Bankers Trust in New York.

A Novell spokesman said the company will provide Dynamic Host Configuration Protocol — already in Daytona — on its LAN Workgroup TCP/IP server next year. Novell will also support Mosaic, WorldWide Web and full TCP/IP access on its upcoming Advanced Client, due next year.

Novell also needs to catch up in the remote connectivity arena. Microsoft's Remote Access Server, which will come bundled on Daytona, connects laptops to both NT servers and, through them, to NetWare servers via Point-to-Point Protocol, Integrated Services Digital Network (ISDN) and Serial Line Interface Protocol, a Microsoft spokesman said.

Novell said it will provide its NetWare Connect remote server with the missing ISDN support in its next release, due out in the first half of 1995.

On the way

Beyond that, Novell has the following in the works:

- **Mobile IPX**, which will support IPX-based access across wireless connections including cellular, data radio and infrared. A future technology will maintain the connection during signal fadeouts that occur in tunnels.
- **Mobile Client**, which will support file replication and synchronization so that a laptop user can plug into the LAN, access information, unplug, work on it, plug in again and have the new information automatically update the original file on server.
- **Mobile messaging**, which will facilitate message exchange for mobile users.

Oracle challenges Lotus

Oracle Documents seeks to rival Notes' features

By Kim S. Nash

■ Oracle Corp. plans to make good next week on vows to go after Lotus Development Corp.'s Notes with a groupware product of its own. The new offering — called Oracle Documents — adds improved text retrieval and other features to Oracle's existing office automation product, sources close to the company said.

Oracle officials declined to comment on Documents' technical specifics but confirmed it will be unveiled at next week's conference of the International Oracle Users Group in San Francisco. Shipping is expected by the end of the year.

Early glimpses of the groupware contender impressed users, who said it could hijack a portion of Notes installed base.

Oracle is also expected to tie its recently announced Oracle in Motion wireless database access product set to Documents.

While Notes mainly caters to small groups of workers on a LAN, Documents "is a true enterprise product, built that way from the start," said Bruce Selvog, a systems programmer in charge of the Tennessee Valley Authority's 12,000-user office automation/electronic-mail system.

Targeting Notes users

Based on the Oracle Office 2.0 E-mail and scheduling product, Documents would appeal to Notes users hemmed in by Notes' inability to support corporate applications running on wide-area networks, according to a database analyst at a large pharmaceutical firm.

"Oracle could capitalize on that need," said the user, who asked to remain anonymous. "If [Documents] can interface with Notes, all the better."

One shortcoming of Office 2.0, however, is the product's lack of support for two major E-mail protocols: Vendor-Independent Messaging and Messaging Application Programming Interface [CW, Feb. 28]. It is unclear whether Documents will work with either protocol.

Important features

According to users, key features of Documents include the following:

- Support for SQL commands to get at corporate data. As a flat-file database, Notes handles only text and cannot understand SQL commands.
- Multimedia support via an interface between it and Media Server, a version of the Oracle 7 database designed to manage full-motion video and CD-quality sound.
- Native support for the X.400 E-mail standard instead of handling X.400 protocols through an interim gateway.

Different strategies

Oracle is also expected to tie its recently announced Oracle in Motion wireless database access product set to Documents. Lotus, meanwhile, recently shelved a similar effort to let users tie radio and cellular devices to Notes [CW, Sept. 12].

"Disconnected clients like that would save us a bundle in telecommunications costs, with so many of our people on the road," Selvog said. The federal agency reaches across seven Southern and Midwestern states, he noted.

Pricing was not available, but Documents' precursor, Oracle Office 2.0, costs $150 per user, plus the cost of the underlying Oracle 7 database.

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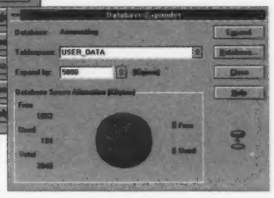
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Alpha may not win, but it's the best

Digital's recent unveiling of a 1-billion-instructions-per-second chip offers clear testimony to the excellence of its engineering vs. its disarray as a business.

Much of the blame for this dichotomy can be laid at the feet of former President Ken Olsen, whose engineering prejudices kept business managers at The Mill one step removed from power. Olsen, however, has been gone for two years, and all Digital has done in the meantime is create doubts about its determination to get itself out of a string of losing quarters. If Digital's engineering culture is to survive, it needs Alpha to succeed. And for Alpha to succeed, Digital needs a no-nonsense display of good business judgment.

If it were purely a technical matter, Alpha would stand tall. Its superior design was evident Sept. 7 when Digital announced it is producing the second generation AXP 21164 chip, with a 300-MHz clock speed and a 1.2-billion-instructions-per-second capability. These attributes are a stunning distance ahead of Pentium, PowerPC and SPARC, and they spring from relatively standard 0.5-micron circuits. It is within Digital's power to plunge to 0.3 micron circuits and gain more speed.



Digital needs a no-nonsense display of good business judgment. If it were purely a technical matter, Alpha would stand tall.

Charles Babcock

The features I like about Alpha include the following:

- **Operating system independence:** Alpha was designed to be operating system-neutral. Its Privileged Architecture Library (PALcode) contains optimized subroutines for basic operating system functions such as context switching, memory management and interrupts. These exist in a software layer independent of both the operating system and hardware. The PALcode is loaded into system memory from a flash programmable read-only memory (PROM), and adding PALcode for another operating system to the PROM is not a big deal compared with converting the whole operating system. Alpha ships with the capability of running OpenVMS, OSF/1 and Microsoft's Windows NT.
- **Multiple instruction launch:** The 21164 issues four instructions per clock cycle, thanks to its superscalar design. Intel's Pentium, another superscalar chip, issues roughly two instructions per cycle. Alpha gains a 6-to-1 advantage in floating-point execution over Pentium and 3-to-1 over the PowerPC.
- **64-bit:** Alpha is a true 64-bit architecture, unlike Hewlett-Packard's 64-bit implementation that mimics 64-bit by doubling up clock cycles in a 32-bit design. Alpha implements 1T byte of physical address space. Meanwhile, 32-bit systems support 4G bytes.
- **Parallel processing:** Alpha is a chip that lends itself to running in parallel processor configurations due to the broad bandwidth of its internal communication pathways. Many RISC chips will not lend themselves to top parallel performance beyond four processors.
- **Partitioned register file:** Integer registers and floating-point registers are frequently combined into one register file on a chip. Both operations are performed out of the file, requiring multiple reads and writes. Alpha separates the two registers and puts them on opposite sides of the chip, close to their adder and multiplier circuits. Alpha compilers are written to honor this more complicated approach.

There are many other features on the Alpha chip that represent an escape from known bottlenecks. Alpha's architects sought to break with the constraints of existing RISC designs and Digital's VAX processors to come up with a truly modern computer.

Despite its many strengths, Alpha may be a case of superior technology that does not win out. It is carrying the millstone of Digital's business problems as it tries to win new adherents. But win, lose or draw, the principles around which Alpha was built will continue to influence computer design for years to come.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

PC server market

IBM server moves could trigger PC comeback

By Jaikumar Vijayan and Michael Fitzgerald

At Networks Expo in Dallas today, IBM is expected to demonstrate a dedicated high-bandwidth add-in card said to turn PC servers into mini mainframes. Its launch kicks off what could be the first day of the rest of the floundering behemoth's life in the PC market.

The card, slated for delivery on Oct. 24, will enable IBM to provide a breakthrough in bandwidth and throughput for the PC server market, claimed Michael Coleman, general manager of IBM's Server business.

The breakthrough should let IBM outstrip rivals such as Compaq Computer Corp. and Hewlett-Packard Co. in the PC server business, and it may signal that IBM is no longer constraining the IBM PC Co. from doing battle with IBM's larger systems divisions.

Also, the new 60/90-MHz, Intel Corp. Pentium-based servers, part of a long-overdue announcement, will feature support for Peripheral Component Interconnect (PCI), enhanced versions of IBM's NetFinity network management software and a mainframe-like intelligent subsystem that will support special dedicated processors such as the communications add-in card. The base price is expected to be in the $12,000 range, according to sources close to IBM.

Fall into products

The servers will cap IBM's fall announcements in the PC market. Other introductions will include the following:

- Aptiva, the PS/1 replacement, due Sept. 26.
- High-end ThinkPad notebooks (see story page 7) and a strategy to unify the PS/2 and ValuePoint lines into a single brand called the IBM PC Desktop series, due Oct. 17. IBM will also announce limited availability of its PowerPC systems (see story page 4).
- The new PC servers, which will be followed by other application servers early next year, due Oct. 24.
- 60/90-MHz and 66/100-MHz Pentium-based two- and four-way multiprocessor application servers, which will be upgradable to the PowerPC through a motherboard/daughtercard implementation, due later in the fourth quarter.

IBM declined to comment on unannounced products.

For many users, the products follow too many disappointments to rekindle any sparks of interest in IBM.

"IBM's emotional loyalty has evaporated here," said an information systems executive at a large corporate user site who requested anonymity.

Analysts say they expect the products to slow but not halt IBM's PC market share erosion in the short term. However, they say that over time, if it effectively executes a fundamental reorganization centered around consolidating the PC Co. in Raleigh, N.C., the company will be in position to bounce back and perhaps even reclaim its No. 1 market position [CW, Aug. 1].

Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass., said an effective server strategy was a must for IBM's recovery.

Worldwide PC server shipments

COMPANY	1992	1993
Compaq	152,267	301,750
Apple	165,267	291,278
IBM	176,286	261,521
Dell	75,125	90,135
Hewlett-Packard	28,298	38,562

Source: Dataquest, Inc., San Jose, Calif.

"IBM is losing share in the client business because of the gap in its server business," he said. For example, Compaq has used its superior servers to get a foothold in corporate accounts and then has successfully gotten users to buy Compaq on the client side as well.

Tom Kucharvy, president of Summit Strategies, Inc. in Boston, added that focusing on a dedicated server strategy in the high-end uniprocessor server market would give IBM a unique approach from which to rebuild share.

IBM will also beef up its NetFinity server management software with support for Windows and Novell, Inc. NetWare servers, according to Coleman.

Long way to go

IBM's fall announcements will mark its first big push into Pentium, and the behemoth has a long way to go to catch up to its competitors. Dataquest, Inc. reports that IBM sold 8,400 Pentiums in the U.S. in the second quarter this year. By contrast, Compaq sold 32,500, Gateway 2000, Inc. sold 57,000, Dell Computer Corp. 38,000 and Packard Bell Electronics, Inc. 38,000 units.

An issue of time

"How come it took them so long to come out with these features?" asked Ken Sacca, a LAN administrator at law firm Fish & Richardson in Boston.

Sacca has already switched allegiance from IBM to Compaq, which has been beating IBM to the server technology punch.

Analysts said the upcoming ThinkPads would extend IBM's technical leadership in the notebook market. Meanwhile, the impact of the desktop brand unification strategy will take time to develop.

The Desktop Series 400 and 700, which top out with a 66/100-MHz Pentium system, will require a multiquarter transition, particularly in moving customers from the PS/2 to the Select-A-Bus architecture in the ValuePoint, sources said. Select-A-Bus gives users the choice of Micro Channel Architecture, PCI, Extended Industry Standard Architecture and AT-bus peripherals.

Senior editor Ed Scannell contributed to this article.

Vendors are offering more powerful servers, but will users swallow the cost? See page 49.

New-wave notebooks boast 'desktop envy'

By Michael Fitzgerald

■ The desktop will come to the notebook market this fall in the form of Pentium chips, true-color screens and industrial-strength, integrated multimedia functionality.

This means notebooks with features typically found in desktop systems, such as high-resolution screens and integrated CD-ROM disk drives — but at a premium. Prices on these high-end notebooks approach $8,000.

The changeover started last week with announcements from NEC Technologies, Inc. and Panasonic Personal Computer Co. and will accelerate Oct. 17 when market leaders IBM PC Co. and Toshiba America Information Systems, Inc. unveil notebooks, according to sources close to the companies.

IBM will announce a 7.2-pound, 33/100-MHz DX4-based ThinkPad with an integrated 5¼-in. CD-ROM, built-in infrared communications, a built-in speakerphone/answering machine and a new "black matrix" display that supports 64,000 colors and reduces glare, according to sources close to IBM.



NEC Technologies' Versa M series *will feature 24-bit true-color screens, though battery life will fade to 50 minutes*

Toshiba, meanwhile, will counter with the T4900, the first Pentium notebook based on the 50/75-MHz chip that Intel Corp. will announce the same day, sources said. Besides Pentium, the redesign will include the AccuPoint integrated pointing device and a 10.4-in., active-matrix color screen, the sources said.

IBM and Toshiba refused to comment.

'Desktop envy'

"It's desktop envy," said Andrew M. Seybold, editor in chief of the Brookdale, Calif., newsletter "Outlook on Mobile Computing." He said the bulk of the market wants full-featured notebooks that weigh less than the 6 to 7 pounds typical of today's models. Vendors tend to chase after the "desktop replacement" market with the idea that users want a portable computer that effectively lets them carry a desktop-class system into the field.

Still, the idea of features such as an integrated CD-ROM drive appeals to some users.

"We see [multimedia notebooks] as a competitive advantage," said Victoria Obenshain, vice president of marketing services at Lutheran Brotherhood Insurance in Minneapolis. She said video and audio pulled off a CD-ROM were differentiators for the company's sales force.

Similarly, John Johnson, a senior programmer at DynCorp. in Reston, Va., said his firm wanted integrated CD-ROM drives and higher-resolution screens to free up hard disk space and provide better viewing.

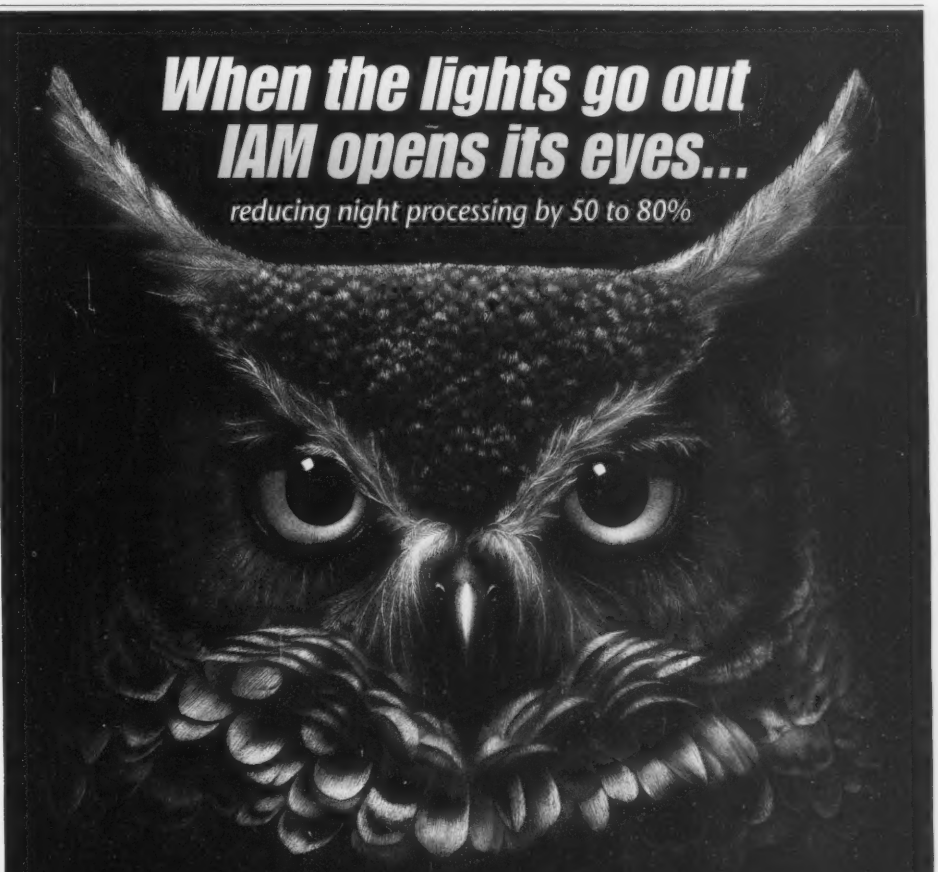
Exemplifying the trend were two recent announcements:

▶ NEC announced the first notebooks with 24-bit true-color screens, or 800- by 600-pixel resolution. The 25/75-MHz DX4- and 33/100-MHz DX4-based Versa M TFT True Color models are priced from $5,399 to $6,159. The high-end version starts at $5,899.

▶ Panasonic announced the V41, which incorporates a 5¼-in. CD-ROM drive, 16-bit stereo sound and a 10.4-in. screen for both passive- and active-matrix color models. It costs $4,299 to $7,799.

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News Shorts

CIOs moving and shaking

Last week was busy for at least two information systems groups. James L. Halsey was named senior vice president and chief information officer at **Warner Bros, Inc.** in Burbank, Calif., effective Nov. 1. At **Avon Products, Inc.**, Spencer McIlmurray replaces Raymond Perry as top IS executive at the New York-based cosmetics firm. Meanwhile, a presentation at the **Society for Information Management**'s conference this week will discuss how CIOs are focusing more on high-level business issues and less on technology.

FTC charges ad-meister on the Internet

In its first case targeting advertising on the information superhighway, the **Federal Trade Commission** (FTC) last week charged a Sacramento, Calif., man with making false claims. The FTC charged that Brian Corzine promoted his $99 credit-repair program on the America Online service to advise consumers to take illegal steps to repair their credit records.

Technology continues to haunt NASDAQ

A stock trader's error on a **NASDAQ** exchange price-reporting system on Sept. 9 led to incorrect prices for at least 30 New York Stock Exchange stocks reported in newspapers across the country that weekend. The error involved a trader's misuse of NASDAQ's Automated Confirmation Transaction system, which in turn led to the inaccurate prices on various stocks, including IBM and Wal-Mart Stores, Inc. These prices were transmitted by a NASDAQ system that distributes price data to The Associated Press. Officials at the National Association of Securities Dealers, which runs NASDAQ, said investors who sold shares that day were not affected by the mistake.

IBM heads up $60 million DOD project

The **Department of Defense** has set up a $60 million project led by **IBM** that is aimed at developing software standards that would enable U.S. manufacturers to more easily share information with one another when jointly working on programs. Fourteen vendors and universities are also participating, including Digital Equipment Corp. and Texas Instruments, Inc. The government is funding about $27 million of the project cost; the rest will come from the other group members.

Amdahl, Sun bulk up Solaris 2.3

Amdahl Corp. and **Sun Microsystems Computer Corp.** last week introduced A+Edition, an extension to Sun's Solaris 2.3 operating system for mission-critical applications that can nearly double the performance of a Sun 16-CPU system. Available immediately, the A+ software is priced from $1,500 to $2,500 per CPU. Also last week, Sun unwrapped the 64-bit UltraSPARC chip, which is expected to make its first appearance in computers sometime next year.

Forte's high-end tools also priced high

Forte Software, Inc. has started shipping a family of high-end development tools that offer a slew of flashy features, including the ability to develop across hardware platforms. But at $75,000 a pop and with a proprietary fourth-generation language, analysts wondered just who would bite.

SHORT TAKES Joel S. Engel, vice president of technology at Chicago-based **Ameritech Corp.**, was one of five recipients announced last week for the 1994 National Medal of Technology for his pioneering work in creating cellular communications. . . . **Software 2000, Inc.** plans to start delivering this week on its promise of object-oriented applications for IBM's AS/400 systems, first in a human resources package.

MCI software opens multimedia world

By Ellis Booker

In a move that industry analysts likened to a shot across the bow of rival AT&T Corp., MCI Communications Corp. last week introduced NetworkMCI Business, a Windows software product bundled with a multimedia public network service.

Introduced at Networld/Interop '94 in Atlanta, NetworkMCI Business includes electronic mail, news feeds, collaborative work tools and Integrated Services Digital Network (ISDN)-based videoconferencing. Internet capability is planned by year's end.

First up

For its part, AT&T earlier this year announced plans to provide many of the same types of features through alliances with Lotus Development Corp. (public Notes servers), Intel Corp. (videoconferencing) and Novell, Inc. (LAN-to-LAN access across the public network).

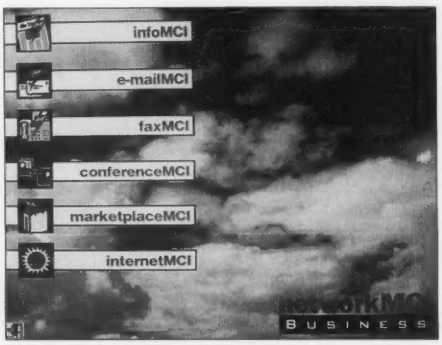
MCI officials noted one key difference: Its service is available for sale today.

Beta user Ken Logue, president of search firm Logue & Rice, Inc. in Vienna, Va., praised the ISDN-based videoconferencing option and the collaborative work capabilities of the package.

"You can see the person you're talking with and have their resume on the same screen for editing," he said.

AT&T officials said the MCI introduction did not alter their timetable for AT&T Network Notes, which is due out by the end of the first quarter next year. They did, however, confirm that they are looking into an "integrated" front end to work with Network Notes and elements of the existing WorldWorx family. The WorldWorx line contains an ISDN-based videoconferencing product.

Like MCI, AT&T hopes to use its platform for services such as online catalogs for retail applications. Two weeks ago, AT&T announced that Egghead Discount Software would begin testing just such an application by year's end using AT&T Network Notes.



MCI's NetworkMCI Business *offers E-mail, ISDN videoconferencing, news feeds and collaborative work tools*

No retail

MCI will distribute the $100 front-end software for NetworkMCI Business through its direct and telemarketing sales force. Joe Zuccari, vice president of systems and support for MCI business markets, said there are no plans to sell through retail channels.

MCI's technology partners include PictureTel Corp. in Danvers, Mass., ConnectSoft in Bellevue, Wash., DataBeam Corp. in Lexington, Ky., and Delrina Corp. in San Jose, Calif.

Senior writer Lynda Radosevich contributed to this report.

Ardis readies for cellular network by slashing prices for mobile users

By Ellis Booker and Michael Fitzgerald

■ Ardis Co. will tomorrow announce sweeping price cuts that it said will reduce monthly bills for typical mobile users by more than 25% beginning Jan. 1.

This is the first price reduction in the five-year history of Lincolnshire, Ill.-based Ardis, which was the first to offer a nationwide wireless packet data radio service. Analysts said the action was long overdue.

Ardis has been slow to draw customers, as has its only rival, RAM Mobile Data, Inc. Its pricing move is intended in part to draw customers before the new Cellular Digital Packet Data (CDPD) network, backed by multiple vendors, is finished. The limited commercial CDPD service does not have nationwide service or pricing.

"Ardis has never been a price leader, so this is . . . bringing their prices in line with RAM and CDPD," said William Frezza, president of Wireless Computing Associates, Inc. in Yardley, Pa.

Ardis executives said the price cuts would boost their user base of 36,000 to 40,000 users in 80 corporate accounts. The company would also like to see its device suppliers and service partners "bring prices down, too," said Rob Euler, vice president of business development at Ardis.

Price break

Ardis will lower its prime-time message unit charges from 8 cents to 6 cents and per-character charges from 4 cents to 3 cents per 100 characters. Off-peak and monthly minimum usage charges are likewise being lowered. In addition, Ardis cut prices for ServiceXpress, its wireless field service solution, by at least $25 per month per user. And Ardis Personal Messaging will see a 25% increase in the number of message units allowed under various rate plans.

In conjunction with the price cuts, Ardis plans a new product, dubbed Short Message Service, which will be priced at 3 cents for messages of eight characters or less.

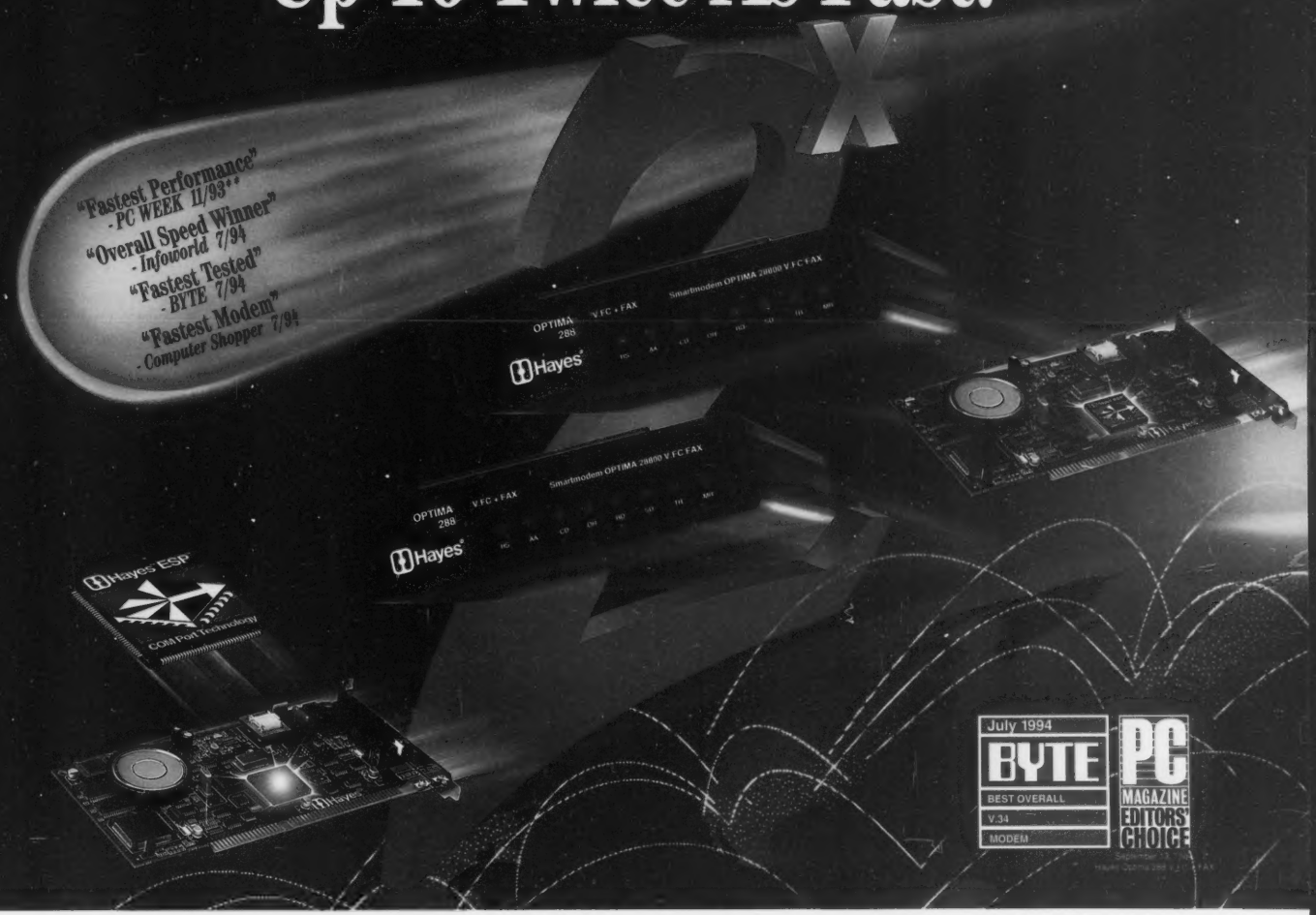
Analysts said the price restructuring was logical. "I think they are tired of having to justify their anemic number of subscribers," said Karen Scherberger, an analyst at Gartner Group, Inc. in Stamford, Conn.

She added that the move might even spark a price war in the industry, which was good news for users who perceive wireless data networking as prohibitively expensive.

But Frezza and other observers said a price war was unlikely, given the current high cost of the Ardis service. Ardis expects its price restructuring to result in "several million dollars" in lost revenue but expects to offset the loss over time with added customers, it said.

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SHL unveils 'push-button' re-engineering tool

By Mark Halper

SHL Systemhouse, Inc. today will move into the age of push-button client/server re-engineering by introducing software that walks managers through business process and application development changes.

The product, called SHL Transform, resides on Unix, OS/2 or Microsoft Corp. Windows NT servers. Organizations redesigning their business processes would disseminate the product on their desktops, said Michele Rebiere, director of business development at the Ottawa-based outsourcer and systems integrator.

Under development for four years, Transform includes text, video and sound presentations of methodologies, instructional programs and a collection of research material, said Rick Beatty, an SHL Systemhouse vice president. The company is charging a license fee of $1,000 per user for methodologies only and $2,500 per user for the whole package.

In what some nonbelievers consider an appropriate pitch, SHL's own product literature acknowledges that "there's a fine line between skepticism and belief."

Tom Nefeldt, data processing manager at Writer's Guild of America West in West Hollywood, Calif., counted himself among the doubters.

While not familiar with Transform in particular, Nefeldt said he questioned the effectiveness of an automated approach to re-engineering — a process that often requires third-party consulting help.



Writer's Guild's Tom Nefeldt: *Can a dispassionate approach to re-engineering offer a fresh perspective?*

"I think you always need a fresh outside perspective," said Nefeldt, whose organization has turned to consulting firm Coopers & Lybrand for re-engineering ideas. "I suppose a dispassionate computer program could give you that perspective, but I'm not sure we want a dispassionate approach."

Happy customers

SHL Systemhouse claims to have already signed on several believers, including the Montreal Stock Exchange, Bank of Montreal and Tupperware Corp.

Pierre Bourassa, assistant senior vice president of MIS at the Montreal Stock Exchange, said he has been using Transform since July to assist some 125 developers in a three- to four-year systems overhaul.

The exchange is slowly moving all its stocks and futures trading activity off a Digital Equipment Corp. VAX and onto Sun Microsystems, Inc. Unix servers running a Sybase, Inc. database and tied to Sun workstations and PCs. It is also developing programs to enhance communications with and among its member trading firms.

"Transform is a huge repository of knowledge on running projects," Bourassa said. "It describes the steps you should follow to develop software, and it's also a hands-on type of training."

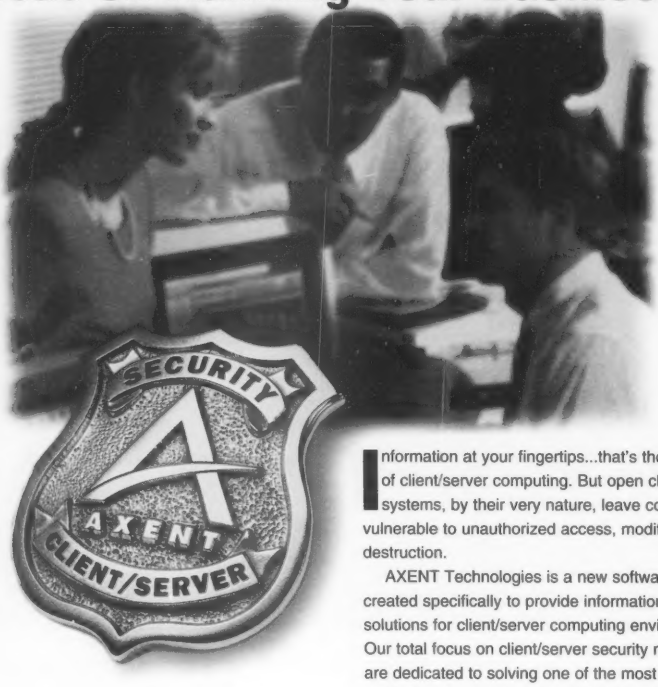
Bourassa said the on-line approach was far superior to old paper-based methodologies because "one subject is linked to another in a logical way, instead of having tons of binders difficult to reference sitting around on a bookshelf."

It is not new for consulting firms to sell paper or automated methodologies — Andersen Consulting offers on-line versions of its Foundation methodology. However, Rebiere claims Transform is the first to integrate methodology with training sessions and research material and to include multimedia sessions.

Mark Hodges, vice president at G2 Research, Inc. in Mountain View, Calif., said he expects to see more integrators and consultants offering automated methodologies and on-line training.

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Cisco moves to blanket remote-access market

By Stephen P. Klett Jr.
ATLANTA

Cisco Systems, Inc. continued its aggressive attack on the remote LAN access market, launching a product blitzkrieg at Networld/Interop '94 here last week.

The internetworking company — known for its high-end backbone and enterprise routers — unveiled five remote-access product families for connecting mobile and branch-office users to corporate LANs.

The announcement builds on a series of related moves Cisco has made in the last several months, including the release of Integrated Services Digital Network interfaces for its 2500, 4000, 4500 and 7000 series routers and the acquisition of remote-access software provider Newport Systems Solutions, Inc.

The high-volume and low-price sector of the remote-access market represents relatively uncharted territory for the San Jose, Calif., company, observers said.

"We've relied on Cisco for our high-end needs, but its low-end offerings have lacked cost competitiveness and functionality compared to other vendors. In short, its low-end strategy has been woefully inadequate," said one network manager at an East Coast bank who asked not to be named.

"This announcement is very important for Cisco — it really needed to come out swinging," said Charlie Robbins, a vice president at Aberdeen Group in Boston.

Turning failure around

Earlier this year, Cisco acknowledged that it lost out on several potentially large remote-office contracts, including one with Wal-Mart Stores, Inc. Why? High prices and the fact that it really had only one product — the 2500, observers said.

With the announcements, Cisco expects to climb to the top of the remote-access hill. It is also trying to compete with 3Com Corp.'s suite of remote-office products and Boundary Routing strategy, analysts said.

"We've had point products until now with no overall strategy; now we have that," said Kevin Kennedy, Cisco's director of Access products.

Cisco's five new product families include the following:

- **Cisco 1000 LAN Extenders:** A two-port hardware platform with switching software designed for remote offices, which generate limited client/server traffic over a wide-area network link and require only one wide-area connection to a central site. Two models will ship next month priced at $1,595 each.
- **Integrated hub/router versions of the 2500:** Developed with LanOptics Ltd., they combine LAN/WAN routing and wiring concentration. Eight- and 16-port Ethernet versions will ship in November starting at $3,095.
- **Cisco AccessPro PC Card:** A 2500 router on a card for Microsoft Corp. Windows NT Advanced Server PCs. It shipped last month for $1,995.
- **Cisco Access Server family:** A series of four remote-access servers based on the 2500, which let up to 16 users access corporate networks via standard telephone lines. All models will ship next month starting at $2,995.
- **Three new models of the 2500:** They will support two LAN connections each instead of the single connection offered by the original models. They will also ship next month priced starting at $2,995.

LightStream offers backbone ATM twist

By Stephen P. Klett Jr.
ATLANTA

Users who want to implement Asynchronous Transfer Mode (ATM) backbones today but are holding back because of compatibility concerns with their legacy LAN equipment received a shot in the arm last week at Networld/Interop '94 here.

Amid a virtual cacophony of vendors making switch announcements [CW, Sept. 5], LightStream Corp. in Billerica, Mass., unveiled its second-generation, wide-area and campus backbone ATM switch. The LightStream 2020 meshes ATM, Ethernet and Fiber Distributed Data Interface (FDDI) traffic while performing bridging, routing and switching functions.

It will be one of the first backbone switches to provide this mix of functions when it ships next month at prices ranging from $21,700 to $300,000, analysts said.

Ethernet, FDDI and ATM interfaces let users use the 2020 to build an ATM backbone that supports native LAN internetworking. The switch will initially support Ethernet and FDDI bridging and protocol filtering over the wide area. LightStream plans to deliver multiprotocol routing support via a software update in the first half of next year.

"This [product] will serve as a catalyst to move ATM from the domain of the technologists into the corporate environment," said Charlie Robbins, a vice president at Aberdeen Group in Boston.

Roadblocks ahead

The following constitute the most significant barriers to implementing ATM over the next two years

1. Cost of equipment
2. Interoperability
3. Availability of services
4. Cost of transition
5. Availability of products

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Source: The Yankee Group, Boston

Observers said the combination of switching and routing assures would-be ATM users that their investments in legacy networking equipment will be preserved.

"Not many users looking to move to ATM today have Ethernet backbones; they have FDDI, and this switch will preserve that investment," said Jennifer Pigg, director of data communications at The Yankee Group in Boston.

Speed at a price

The LightStream 2020 can forward 64-byte IP packets at a rate of 1.5 million packets per second, according to independent tests performed by Scott Bradner, a consultant at Harvard University's Network Device Test Lab.

But this performance does not come cheap. While pricing for the 2020 starts at $21,700, a fully configured box tops out at $300,000.

Meanwhile, beta users were upbeat about 2020's long-term potential benefits for their networks.

The Health Sciences Center at the University of Colorado in Denver is relying on the switch to transfer 20G- to 60G-byte medical imaging files in its human atlas database. "These files are far too large to be efficiently or cost-effectively accessed over our [FDDI] network. We needed ATM and felt the 2020 offered the highest level of investment protection," said David Weiser, assistant vice chancellor at the office of information systems.

Continental Cablevision in Boston is deploying seven 2020 switches to form the backbone of its network to provide new communications services to its customers. It went with ATM to "future-proof" its network, said Kevin Casey, vice president of engineering. "While standards clearly need work, ATM is the technology that will best position us for the future."

Sybase to offer controlled release of Navigation Server

By Kim S. Nash

Sybase, Inc. last week revealed pricing, hardware requirements and other tidbits about its long-overdue Navigation Server multiprocessing database add-on and vowed to ship a so-called "controlled release" of the product next month to select customers. The real thing is not due until December or possibly January — seven to eight months later than promised.

Navigation Server was announced as part of Sybase's System 10 product line in November 1992 and was supposed to ship by the end of last year. The date was changed in April to mid-1994.

Unforeseen reworking and fine-tuning have run Sybase and development partner AT&T Corp. off the mid-1994 delivery goal [CW, April 11]. Also, Configurator, a companion product designed to automatically set up, monitor and tune Navigation Server systems, will be in beta stages when Navigation Server ships.

In lieu of Configurator, Sybase plans to send support people to sites with Navigation Server. "We will send specialists in with Navigation Server ... to watch [Configurator] for a while and make sure it is making good recommendations," said Terilyn Palanca, Sybase's director of product management for parallel and distributed products.

A few large Sybase and AT&T users, such as The Chase Manhattan Bank NA and US West, will receive Navigation Server next month, and Sybase technicians will guide these sites through installation and testing, Sybase officials said.

Chase is due to begin trials of a 250G-byte credit card marketing application next month. The data pool is projected to balloon to 600G bytes, encompassing five years of data on 6 million shoppers, by the end of the first quarter of 1995.

If all goes well with the Unix/Navigation Server combination, the grand plan is to move a marketing system off several IBM ES/9000 mainframes, said Jane Landen, Chase's vice president of bank card services. Test runs in June on 80G bytes of material showed "excellent results," she said.

In a flash

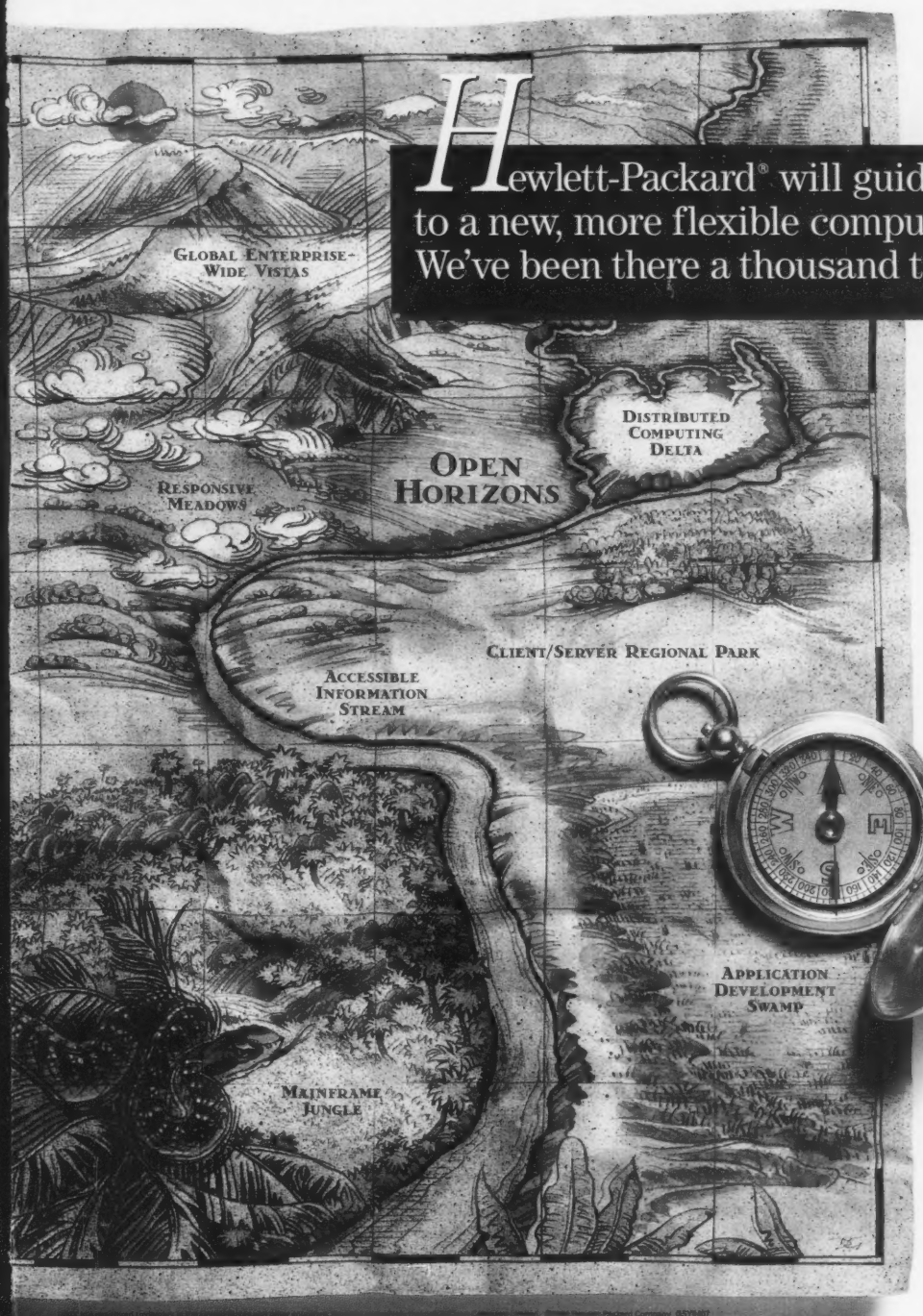
Massively parallel processor setups, with Navigation Server, can speed common database operations, according to Sybase. Updates, for example, became 7½ times faster, and inserts finished 6.6 times faster in tests done at AT&T.

Navigation Server nutshell

Platform supported*	AT&T 3600 MPP machines
Other requirements	Needs a copy of Sybase SQL Server at every node
General availability	December 1994
Price	$150,000 (4-CPU system); $14,000 for each additional CPU

*IBM, HP and Sun promised for mid-1995

Sybase shoots for more customized support plan. See page 79.



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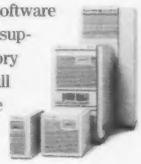
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Systems management

SMS debut draws crowds, queries

Corporate role remains uncertain

By Steve Moore

Attendees at last week's Networld/Interop '94 conference flocked to witness the first public demonstration of Microsoft Corp.'s long-awaited Systems Management Server (SMS). Analysts were bullish about SMS, but some users expressed doubts about the complex product's potential role in their organizations.

Previously known as Hermes, SMS will initially support three systems management functions for networked PCs: hardware and software inventories, remote performance analysis and trouble-shooting, and software distribution and installation.

Although pricing was not announced at the show, a Microsoft spokesman later said the SMS server license will cost about $650 and the individual client $50.

Microsoft reputation

"SMS is destined to be big time for two reasons: It's quite a good product, and it's from Microsoft," said James Herman, a principal consultant at Northeast Consulting Resources, Inc. in Boston. Herman singled out SMS' scalability and support of IBM and Apple Computer, Inc. operating systems.

Still, some users took a more pessimistic view. In terms of supporting PC performance management and inventory management for a data-intensive commercial printing operation, "SMS won't come close to doing what I want," said Hank Hensel, network manager at Publishers Printing Co. in Shepherdsville, Ky.

"We've run our routers and NetFrame servers into the ground" in an effort to provide 300 users with rapid access to 1.4T bytes of data across 14 servers and a broad variety of on-line and off-line storage media, Hensel said. "SMS has possibilities, but I can't see it accomplishing what we need for systems management today," he added.

Complex mixture

A user at a Midwestern university who requested anonymity, said, "SMS won't work for me because I have such a mixed LAN environment. It only runs on NT Server, and it doesn't support Unix desktops."

But SMS will be valuable for users whose LAN environments are in flux, said Bob Janusaitis, a LAN technology consultant at Business Systems Group in Houston. "If I'm going to migrate a company from one operating system to another, it would be well worth it to purchase SMS to assist in that process," he observed. But ultimately, "It's all going to come down to what SMS costs," Janusaitis added.

In Microsoft's favor is its strong support of the Desktop Management Interface (DMI) standard, which allows PCs to provide information about their hardware and software to management applications. Microsoft built DMI support into SMS. As a result, Herman said, "Microsoft is positioned to inherit all the advantages that DMI will bring to the industry."

Hermes: A god of high-end servers?

Microsoft's SMS was previously named after Hermes, the Greek god of commerce, eloquence, invention and travel. But after a glance at Microsoft's SMS specifications sheet, users may deem SMS to be the god of high-end server requirements and broadened client options.

SMS runs only on Windows NT Server Version 3.5 or later. It also requires Microsoft's SQL Server Version 4.2 or higher.

On the client side, SMS supports DOS, Windows, Windows NT and Windows for Workgroups, as well as OS/2 and Apple's System 7.

SMS now focuses on three systems management tasks for networked PCs. These include hardware and software inventory, configuration and performance management and software distribution and installation. A Microsoft spokesman said the next key systems management function to be provided in SMS will be software license metering.

—Steve Moore

Legent to add software agents

Product set will aid users in systems management efforts

By Rosemary Cafasso

■ Legent Corp. last week outlined plans to extend its systems management offerings with one of the trendiest things going: software agents.

Called AgentWorks, the product set is intended to help users build and maintain agents as part of their overall systems management effort. The agents — basically small software programs — would monitor network, hardware and software activity based on users' criteria, then send alerts or initiate corrective actions should something go wrong.

But Legent's efforts, according to observers, go beyond jumping on the latest industry fad.

AgentWorks could coexist with the company's bigger systems management framework, called Cross Platform Exchange (XPE) and essentially feed the XPE management tools system activity data. However, the company will offer AgentWorks as a separate product line that does not require XPE products.

Agents at work

Two the five products that make up AgentWorks are the following:

- **System Manager:** Provides a single view of agent data for Hewlett-Packard Co., IBM and Sun Microsystems, Inc. Unix servers.
- **DB Manager:** Provides agents to manage databases, starting with Oracle Corp.'s database management system.

"It's a good move," said Rick Villars, an analyst at International Data Corp. in Framingham, Mass. "The big problem with XPE was getting out of the data center. To really succeed, they need to get into nonstandard Legent customer sites. This technology gives them entrees."

Legent has been working on agent technology for more than a year and shared some development work with IBM on a project called Mercury, which both companies announced earlier this year. AgentWorks is the result of those efforts. IBM will announce products and strategies on its own in the next several months.

Meets functional needs

"It's not there yet in the sense that any beta is not there yet, but it shows promise," said Kathy Neuman, a partner at Price Waterhouse who is evaluating AgentWorks for clients. "It meets most of the functional needs that we had hoped for."

Initially, AgentWorks will consist of five products ranging in price from $5,000 to $12,000. It will be available in the late fall.

WordPerfect unfolds integration plan

By Lynda Radosevich

WordPerfect, Novell, Inc.'s applications group, last week outlined a broad strategy for integrating its electronic mail, document management and forms products. Its goal is to create a set of network components to access NetWare's back-end services via common industry interfaces by the end of next year.

A side benefit for users is less expensive maintenance costs, according to Novell. It estimates that integrating E-mail, document management and forms will save $250 to $400 per node per year in maintenance costs. That is because of common administration, installation and directories.

Mixing it up

Separately, Novell officials also hinted at an upcoming announcement with FileNet Corp. that will link imaging services with NetWare.

Making great plans

Called the Collaborative Computing Environment, the strategy builds on the Open Messaging Environment (OME) plans Novell laid out last March. With OME, Novell promised to integrate Novell GroupWise (formerly WordPerfect Office) and its Message Handling Service (MHS), a messaging transport that works with NetWare, into an open client/server product by the end of next year. The openness would come by using Microsoft Corp.'s Messaging Application Programming Interface and other application programming interfaces.

Last week, Novell added the SoftSolutions document management and InForms forms software to those plans. All the components will natively use NetWare's message transport, directory, license management and other services by the end of next year. Also, they will share a common installation procedure. That should lower the administration costs, Novell officials said.

Users and analysts reached last week were encouraged but underwhelmed.

"It's a strong message and an ambitious plan, and it would be great but lucky if they do it all in that amount of time," said Gary Wilkerson, supervisor of end-user services at Kaiser Foundation Health Plan of Georgia, Inc. in Atlanta.

"That's exactly what they have to do. Anything else doesn't make sense," said David Marshak, a vice president at consulting firm Patricia Seybold Group in Boston. "Their calendaring and scheduling is way ahead of [Lotus Development Corp. and Microsoft products], and their mail is better. But in the integration of document management and forms, they're just catching up," he said.

Novell shipped the first piece of the Collaborative Computing Environment last week, just a few months behind schedule. It is a bidirectional gateway that synchronizes the GroupWise and MHS directories and the NetWare bindery. By year's end, all three will be administered via the NetWare Directory Services in NetWare 4.1, said Stuart Nelson, a Novell vice president of research and development.

In the same briefing, Novell officials hinted that they soon plan to unveil a public groupware network along the lines of the much-publicized AT&T Corp. Network Notes, which AT&T and Lotus announced earlier this year.

LAN Server 4.0 unlikely to make users switch

By Ed Scannell

Addressing past problems, IBM last week formally announced LAN Server 4.0, replete with ease-of-use features and broader Ethernet and Token Ring support. But despite these improvements, some users and analysts said the product still faces an uphill fight against the formidable installed base of Novell, Inc.'s NetWare and Microsoft Corp.'s aggressive pricing strategy for Windows NT.

"We think IBM's product is good, but we are still inclined to work with Novell and fix whatever problems we have rather than switch over," said Judge Fowler, senior vice president and director of systems development at First Union Corp. in Charlotte, N.C. The bank has about 120 servers running on NetWare 3.11 and 3.12. "Unless Novell falls really short with its next offering, we'll stick with them," he said.

Betting big

LAN Server 4.0 remains integral to IBM's client/server strategy. Company officials said last week they will offer industry-standard distributed computing services to deliver Global Directory, Security and Remote Procedure Call from the Distributed Computing Environment in the first half of next year.

While all-IBM information systems shops said they largely like what they see in LAN Server 4.0, they acknowledged that it could be a long battle to persuade upper management to swap out large numbers of NetWare 3.x-based servers. This was true even in those shops with a fair amount of OS/2 on the desktop.

"We would seriously consider converting our NetWare servers over because it eases our configuration problems [with our OS/2 desktops]. But I'd like to see some of the conversion utilities for NetWare [LAN Server] first," said Ken Gable, a senior systems programmer at Amerisure & Cos., a large insurance company in Southfield, Mich. IBM has promised to deliver these tools next month.

Pricing strategy needed

Some analysts said they expected IBM to be more aggressive with its pricing to better fend off Microsoft and its Windows NT. They said IBM must correct this problem in short order if it hopes to win broader acceptance of the product.

"The biggest problem they have is not technical but pricing, given Microsoft's Windows NT. That has got to come down," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington.

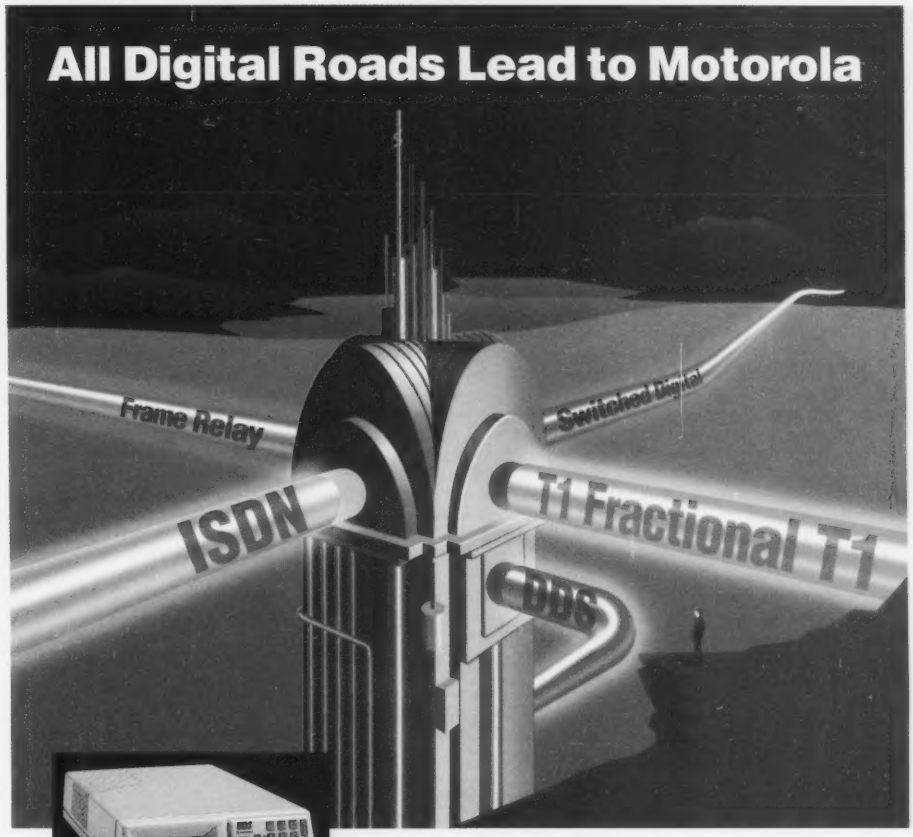
IBM has released two versions of the product. The entry version, targeted at small businesses, is priced at $795. The advanced version, designed for corporate accounts, costs $2,295. The price per client is $50.

"There has been no change in pricing. We still believe charging for clients and servers is helpful to customers because it gives the flexibility to build at a rate they are comfortable with," said Susan Rubino, program director for IBM's LAN systems.

However, users might be more comfortable with Microsoft's current pricing for Windows NT Advanced Server — $999 — and the fact that it allows users to add an unlimited number of clients without additional cost.

Both versions of LAN Server feature a new Workplace Shell-like graphical user interface designed to make installation and configuration easier. Users can now use drag-and-drop capabilities to administer all the product's major features and better fine-tune it to their particular networking environments.

Version 4.0 also supports some 200 communications adapters, including most popular Ethernet and Token Ring adapters, according to the company.



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Novell bids

CONTINUED FROM COVER 1

lines. With the clock ticking, Frankenberg is not wasting any time. At the Networld/Interop '94 conference last week in Atlanta, he gladdened the hearts of customers with his apparent readiness to trim the organizational fat and willingness to rapidly withdraw from fruitless battles against Microsoft in the desktop arena.

Furthermore, the rookie CEO's first take on a long-term product strategy was pretty much on target, analysts and users said. Frankenberg spent the past few months visiting some 115 customer sites to learn what they expected from Novell.

Customers can also expect to be dealing with a smaller Novell in the future. During recent analyst briefings, Frankenberg said that up to 650 more employees would be laid off by January in addition to the 1,100 he trimmed last month. He did not indicate that further major reductions were in the works, "although he left the door open," said Mary McCaffrey, a principal at investment company Alex. Brown & Sons, Inc. in New York.

Frankenberg's next major announcement, expected within the next week or two, will lay out the leaner organization designed to move the company into the next generation of its distributed computing strategy.

The organization will shrink the current 19 business units to 12, with one education, one support and 10 product units divided into four overall groups, Frankenberg said.

Each group will be a separate profit and loss unit and will make its own alliances with third parties. The organization bears more than a passing resemblance to Frankenberg's former employer, Hewlett-Packard Co.

One often-voiced demand from customers has been for the company to return to its NetWare roots instead of expending its forces on fruitless projects such as trying to beat Microsoft in the desktop operating system arena, Frankenberg said in an interview last week with *Computerworld*.

Frankenberg maintains that his strategy — dubbed Pervasive Computing — is a direct response to those demands. The strategy extends the NetWare infrastructure, ensuring it can reliably and transparently provide strategic clients with access to information residing on local or remote UnixWare or NetWare servers or even across the Internet. The types of client machines will range from next-generation Windows 95 desktops to personal digital assistants.

Do the following initiatives make Novell more able to meet your company's client/server and enterprise network computing needs?

	More able	No change
NetWare 4.1 with its Global Directory	45%	30%
WordPerfect acquisition	35%	39%
UnixWare	24%	35%
Visual AppBuilder (Fifth-generation application development environment)	21%	33%

Base: 209 Novell users

Source: *Computerworld* Database Division, Framingham, Mass.

Such a strategy is the right one for the network operating system vendor, said Craig Burton, chairman of Salt Lake City-based consultancy The Burton Group. Novell is a company whose "opportunity lies in building the [networking] infrastructure and technology [to support] ... the virtual corporation," Burton said.

Frankenberg acknowledged that an initial challenge is for Novell to start meeting product deadlines, particularly for crucial offerings already badly behind schedule. These include the following:

- **NetWare 4.1**, the first full-function version of Novell's enterprise network service platform. It is now slated for early December delivery.
- **UnixWare 2.0**, said to be the first viable version of Novell's application platform. It was due last summer but recently slipped another month to January 1995.
- **Visual AppBuilder**, the fifth-generation client development architecture due out last spring and expected to ship this week.
- **Promised UnixWare support of NetWare 4.1 services**, particularly NetWare Directory Services and the NetWare Distributed Management Services. That integration is now slated for later in the year, following the UnixWare 2.0 release, said Novell Executive Vice President Kanwal Rekhi.

Yet another challenge looming for Novell is beating out Microsoft in the distributed computing platform sweepstakes. Microsoft's advantage boils down to users seeing a top-quality application platform as a much more crucial element of their distributed computing architecture than a great set of enterprise networking services, said Rick Villars, an analyst at International Data Corp., a research firm in Framingham, Mass.

Missed chance

"In my particular shop, if Novell brought NetWare 4.x out, and had 4.x done what they said it would do ... we might have stayed where we were [with NetWare]," said Ed Hiller, data processing supervisor at Little Rock Wastewater Utility in Arkansas. "We would have just gone with a Windows environment on top of Novell."

Bankers Trust, for example, is seriously thinking of migrating its 600 to 800 NetWare 3.x servers to Windows NT, according to Joe Schwartz, a consulting software engineer at the New York bank. Even if moving to NT means a 20% decrease in file and print server performance, that could be justified by the advantages that Daytona — Windows NT 3.5 — offers as a scalable, easily administrated application platform, he added.

Novell plans to counter the Daytona threat with its so-called SuperNOS initiative, which will integrate NetWare networking services with the UnixWare application platform sometime next year, Frankenberg said.

For 1996, Novell is promising a fully scalable, distributable, microkernel-based platform that will combine UnixWare and NetWare on the same box. However, that platform will likely be too late to hold on to companies such as Bankers Trust.

One of Frankenberg's major projects is to try once again to rally the Unix industry around UnixWare, which Novell acquired from Unix System Laboratories, Inc. in 1993 as Unix System V Release 4.0. UnixWare shipped about 35,000 units in 1993 and should ship about twice that number this year.

The plan includes making the Novell extensions to UnixWare modular and then offering to support the more useful of other vendors' extensions to Unix, he said.

Frankenberg also faces the task of convincing analysts and customers that Novell's recent WordPerfect acquisition adds significantly to the company's ability to serve the future client/server needs of corporate users.

Some analysts question how Novell can present itself as both an application suite vendor and a purveyor of the "open" Visual AppBuilder architecture for linking client applications to NetWare-based services. The same question has been asked of Microsoft, given its dual role as an application and system software provider.

Frankenberg denied that any but a few leading workgroup and messaging back-end vendors, such as Lotus Development Corp. and Microsoft, would be put off by Novell's ownership of WordPerfect.

Computerworld *Editor Paul Gillin contributed to this article.*

Beta users applaud Lotus' Organizer improvements. See story page 43.

NT honed

CONTINUED FROM COVER 1

such as improved scalability on multiple-processor machines and native 32-bit TCP/IP support — to make that break.

That is where the alliance partners come in. For example:

- AT&T Global Information Solutions is developing networking software that will let Windows NT coexist as a peer with Unix and OS/2 servers, said Bob Kruger, Microsoft's director of strategic relations and standards. The Santa Cruz Operation and other Unix vendors will ship versions of that product, called Advanced Server for Unix, next year, Kruger said.

Also, AT&T GIS last month said it will implement clustering for its NT-based machines and will port its transaction processing monitor software to NT.

- Digital Equipment Corp. is preparing Distributed Computing Environment support for NT and the Common Object Model gateway technology between Microsoft's object technology and Digital's implementation of the Object Management Group's Common Object Request Broker Architecture standard.

Digital is also working on NT clustering for its own machines, said Rich Tong, Microsoft's general manager of corporate and network systems.

- Unisys Corp. announced last spring it will port its X/Open Co.-compliant on-line transaction processing system to NT.
- Several other companies are working to provide additional TCP/IP implementations for NT.

"There are also a whole slew of companies doing X Window [System] clients and servers" for NT, Kruger said.

Berst compared Microsoft's strategy to the Allies' approach to peaceful coexistence with the Soviet Union. Microsoft is saying, "We'll cooperate with you to partition Germany and Berlin, but meanwhile we'll move our missiles up to the front lines," he explained.

Ahead with Unix

Already NT is making inroads into the Unix environment.

"We have a major Oracle database that we use for all of our satellite data sources," said Briscoe Stephens, coordinator of space sciences in the advanced scientific information systems group at NASA in Huntsville, Ala. "Right now it's on [an IBM] 3090, but we're moving it to NT. We're also stamping out [Digital] VAXs. We can buy half a dozen [NT] boxes for less than the maintenance costs" on a mainframe.

"The number of NT boxes will supersede the number of Unix boxes pretty soon," said Daniel Willis, lead analyst at 3M Co.'s information technology group in Minneapolis. However, Kruger said he expects to have a coexistence strategy with Unix servers for the foreseeable future and that Microsoft understands it will never eliminate Unix in enterprise environments.

"The number of NT boxes will supersede the number of Unix boxes pretty soon."
— Daniel Willis
3M Co.

Part of the motivation for some users to move more critical systems to NT from Unix is the constant quest to decrease computing costs.

In the long run, Microsoft's strategy means users will win, even if they buy server technologies from competitors.

That is because Microsoft is driving down prices, said G. Pascal Zachary, author of *Showstopper!*, a book on NT's genesis that will be published next month by Simon and Schuster.

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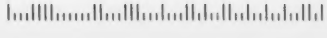


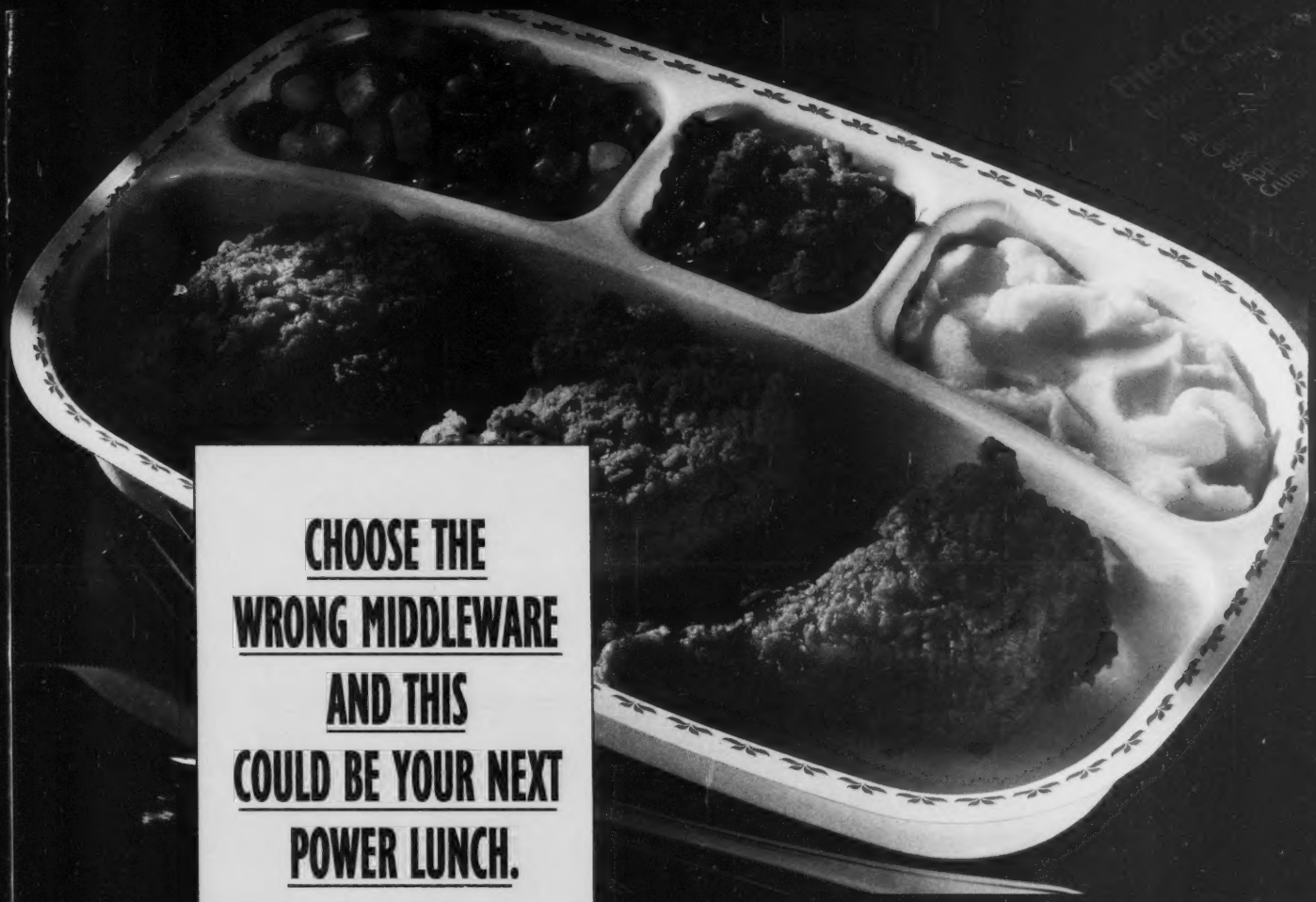
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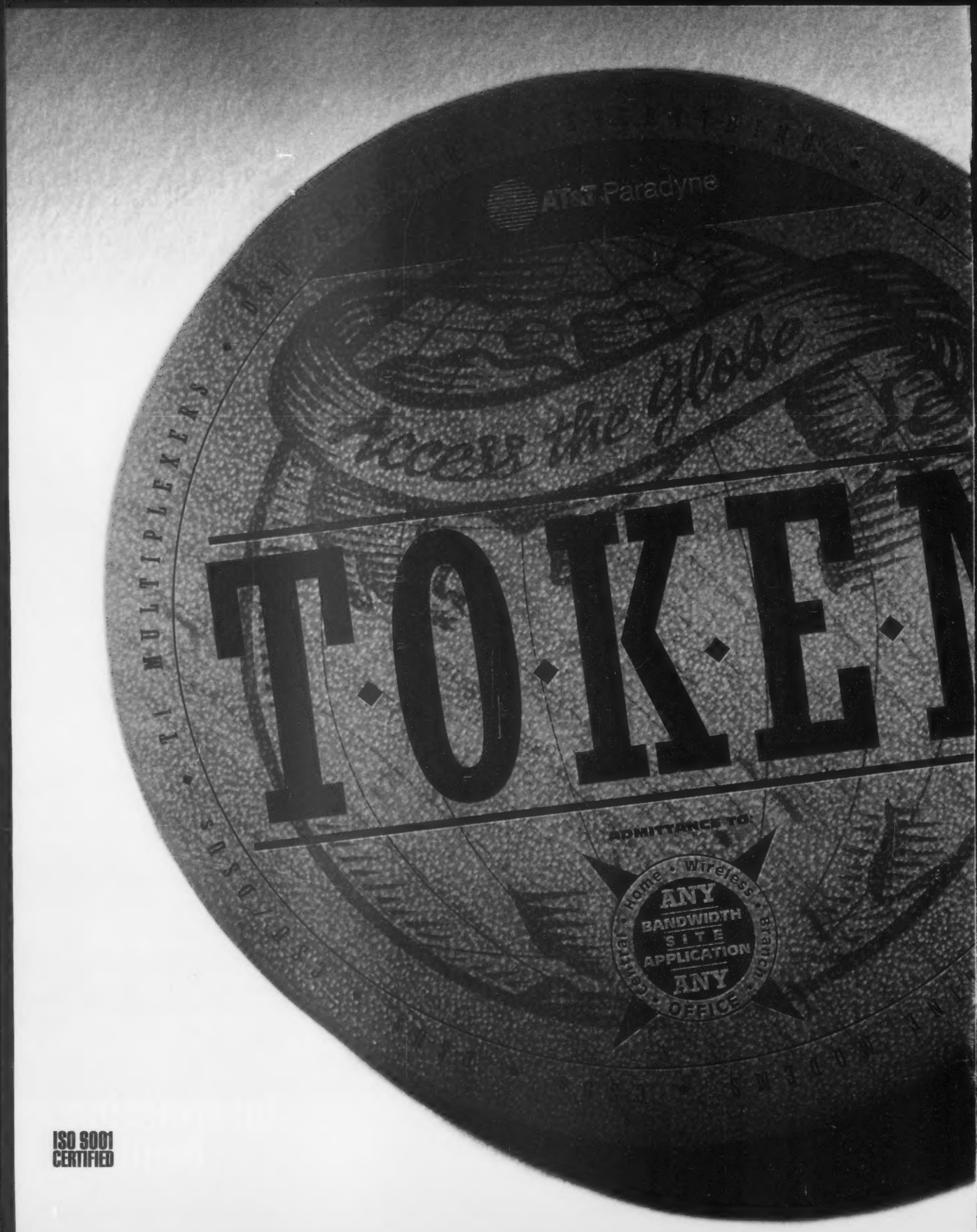
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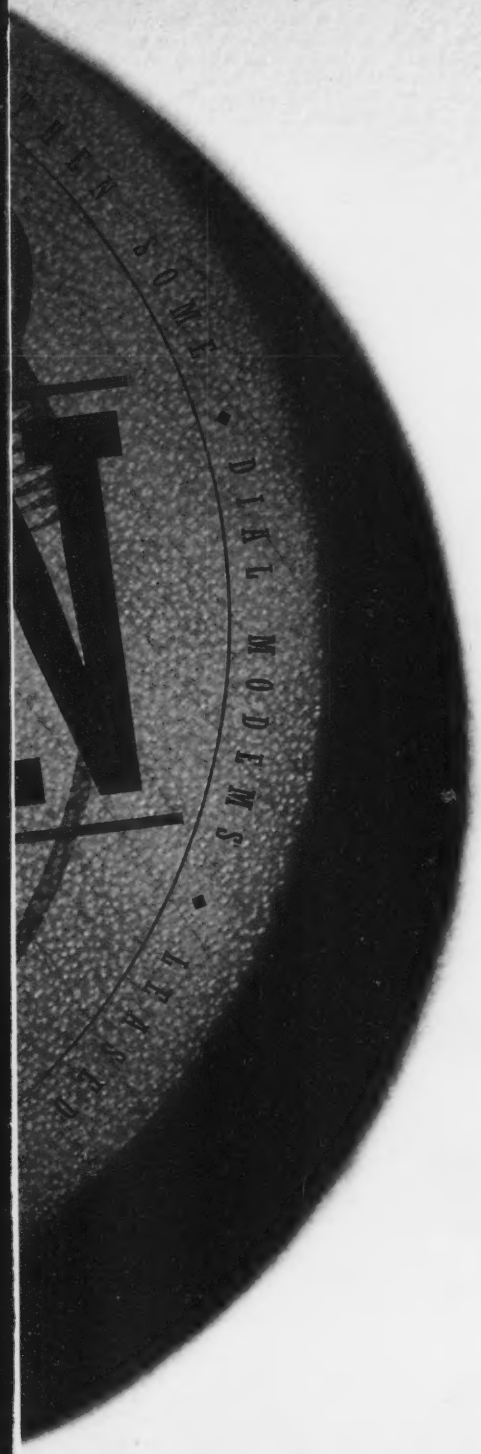
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Digital signal processors to ease, boost upgrades

By Michael Fitzgerald

Ronco, the company that gave us the advertising slogan "But wait, there's more!" has nothing on the makers of digital signal processors (DSP).

These specialized, software-driven chips can combine fax, modem, audio card and other features in one package and can be programmed to do other tasks as well.

A new generation of DSPs has started appearing on the market, and analysts say more DSP-based products will arrive throughout the fall, embedded on motherboards and in a flush of add-in cards. Users say DSPs could eventually save them money and make upgrading hardware peripherals much easier.

DSPs "absolutely look to save us money down the line," said Fred Zickert, manager of microcomputer support at Eaton Corp. in Cleveland. Zickert cited software programmability and upgradability as DSP functions he thinks would work well for Eaton.

DSPs are math-intensive chips that can be programmed to operate as a multitude of peripheral devices largely having to do with audio signals, such as modems and sound cards. Compression and speech recognition functions are possible directions for DSP makers, perhaps by late 1995.

"For the installed base of PCs, the programmable chip is a godsend," said Will Strauss, an analyst at Forward Concepts, a market researcher in Tempe, Ariz.

The market also appears to have Microsoft Corp.'s blessing in the form of the DSP Resource Manager Interface, a programming interface built into the next version of Windows, Windows 95.

Out and up

The DSP market overall is expected to grow significantly in the next three years. Forward Concepts projects it will grow from 6.6 million units this year to 16.5 million units in 1997.

Today, Hewlett-Packard Co. will announce OmniShare, a product that leverages AT&T Paradyne's DSP-based VoiceSpan technology. It lets users share documents while talking on the phone.

Last week, Spectrum Signal Processing, Inc., a Burnaby, British Columbia, firm, began shipping a version of its OfficeFX fax/modem card that uses IBM's MWave DSP to simultaneously function as a sound card. The product costs $349.

"This means you can have your fax running while you're running audio" on your PC, said Barry Jinks, Spectrum Signal's president.

New beginnings

"This could be the start of a burgeoning market," said Phil Lapsley, an analyst at Berkeley Design Technology, Inc., a DSP consulting firm in Fremont, Calif. "For the consumer, you buy one card and it fills the function that several ISA cards currently do."

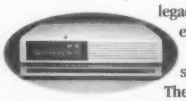
Lapsley said, however, that DSP market growth might be stunted if the industry cannot clear certain hurdles, such as producing faster DSPs to run resource-intensive next-generation modems. Another potential problem is that DSPs work with static RAM, not the less expensive dynamic RAM most chips use. Also looming is the shadow of Intel Corp., which is likely to build modem and other DSP-type functions onto future processors.

Strauss downplayed these challenges, saying that today's DSPs are capable of handling the new V.34 modem standard. In addition, "more sound board and modem control functionality will migrate to the CPU, but data pump functions and things that have to do with really compute-intensive tasks like video compression and encoding will [not]," he said.

Time will tell, but the potential for a third-party application market targeted at DSPs could make life good for people who never get enough features.

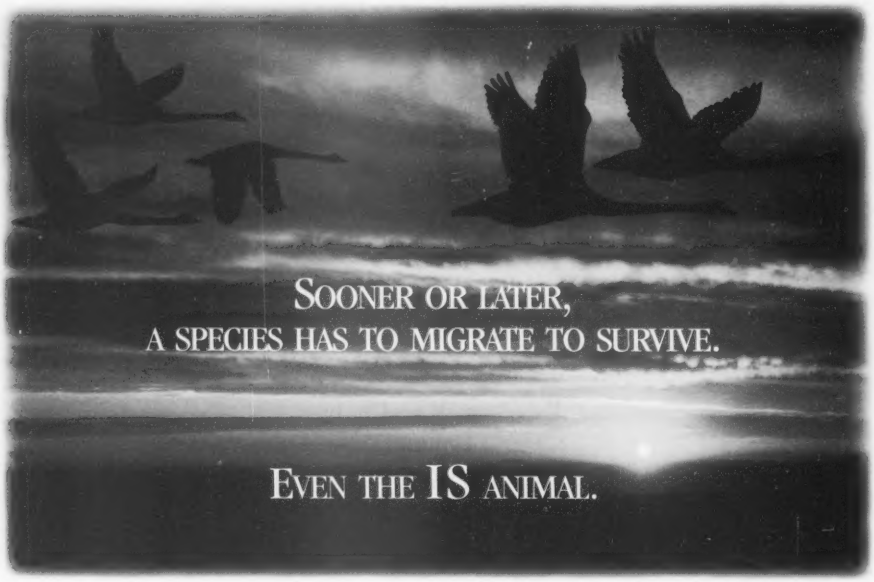
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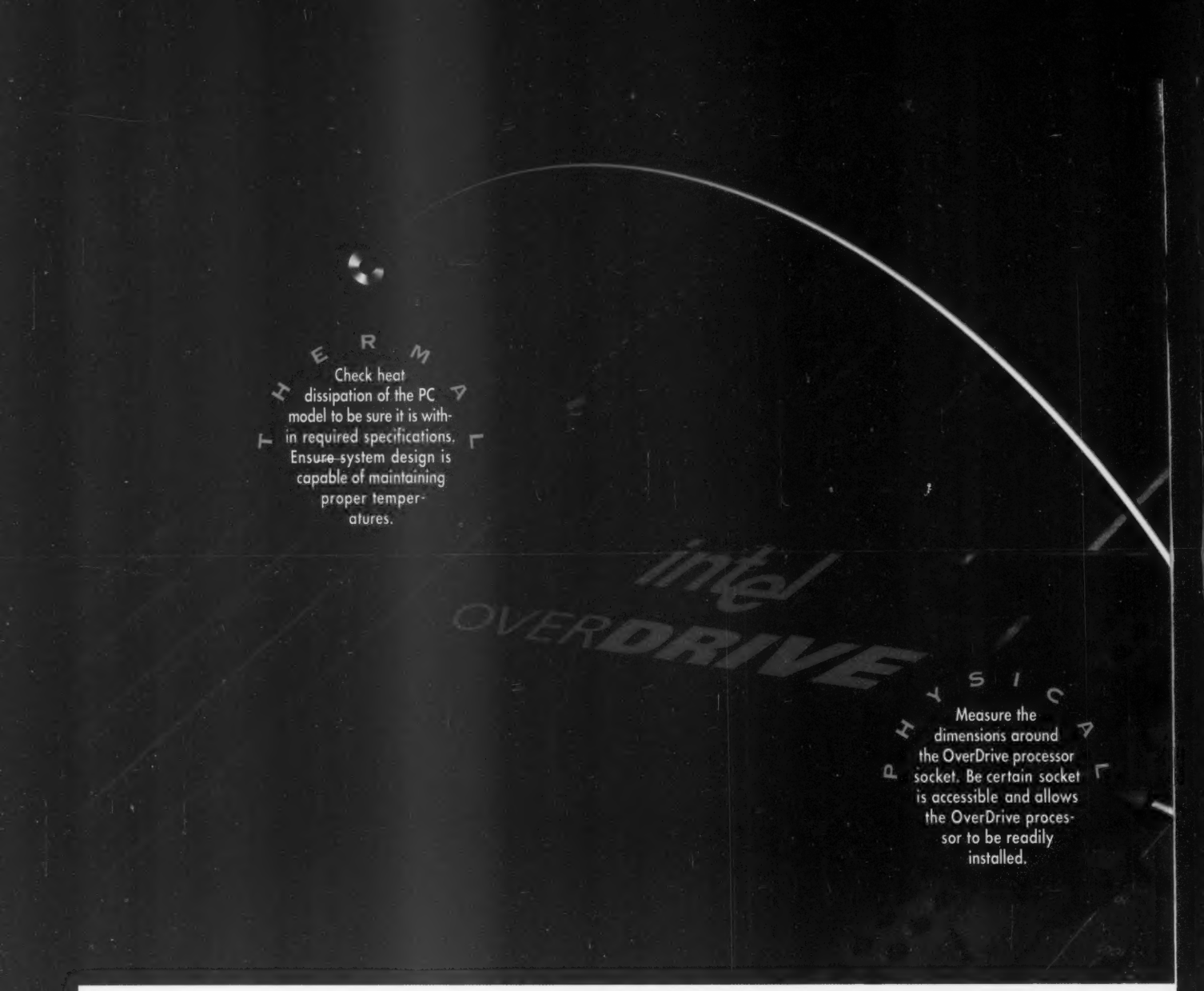
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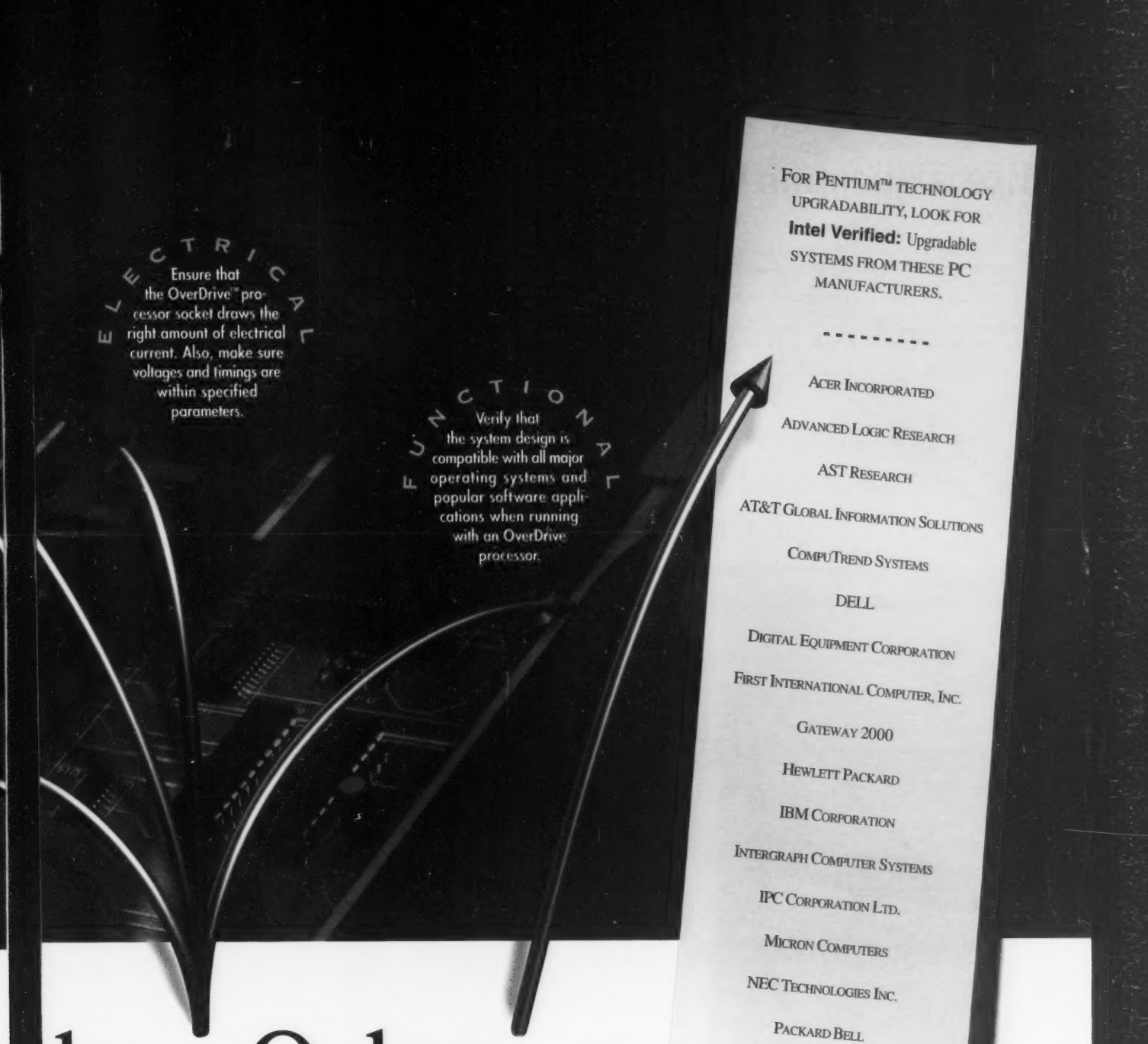
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Execs question info highway security

By Gary H. Anthes
WASHINGTON

Given the Internet's lack of security, intellectual property protection and ease of use, using the so-called information superhighway still presents daunting hurdles for many business users.

That was the underlying message at a recent conference here sponsored by the White House and the private-sector Council on Competitiveness.

"We are bound to run into some obstacles," said U.S. Department of Commerce Secretary Ronald H. Brown. He released a report by the president's Information Infrastructure Task Force that outlined potential benefits of the National Information Infrastructure (NII) in eight industry sectors, including electric power distribution, transportation and law enforcement.

The NII's greatest challenges may be those that exist in the corporations that are would-be superhighway cruisers, some attendees said. "The barriers are not so much technological or even financial; they are cultural — ignorance, dogma and resistance to change," said Jim Manzi, chairman and chief executive officer of Lotus Development Corp.

Dan Schutzer, director of advanced technology at Citibank NA, said two issues concern would-be users of electronic commerce. "First and foremost is security," he said. "How do you authenticate users in real time?"

Further challenges

Search and navigation is the second challenge, according to Schutzer. "How do you find things, and how do you know what's important?" he asked. "We will have information paralysis if we don't handle this carefully."



Several people blamed old-fashioned management hierarchies for blocking networked collaboration within and among companies. "The vertical structure within organizations is an impediment," said Carol Christian, a professor of astrophysics at the University of California at Berkeley.

"Either upper management commits but does not translate down, or the lower levels are enthusiastic but upper management is not committed," said Christian, who is also project manager of a government-sponsored NII pilot project devoted to global environmental change.

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Surfing for sales on the Internet

While some users sit on their hands fretting over obstacles to electronic commerce, department store chain Nordstrom, Inc. is on the move.

This week, the company will launch a service through which shoppers anywhere in the U.S. can order merchandise by sending electronic mail to a team of specialists at the Seattle store.

"We don't have a clue whether it will work or not," said Randy Rehn, information express manager at Nordstrom. "It's kind of scary."

However, Nordstrom has reduced system risk by choosing tried-and-true technology. E-mail will be provided by MCI Communications Corp.'s decade-old service, and products will be delivered by Federal Express Corp.

Although Nordstrom's MCI Mail account — "Nordstrom PT America" — can be accessed via the Internet and other E-mail services, direct access via MCI Mail is secure enough to allow the transmission of unencrypted credit card numbers, Rehn said. — *Gary Anthes*

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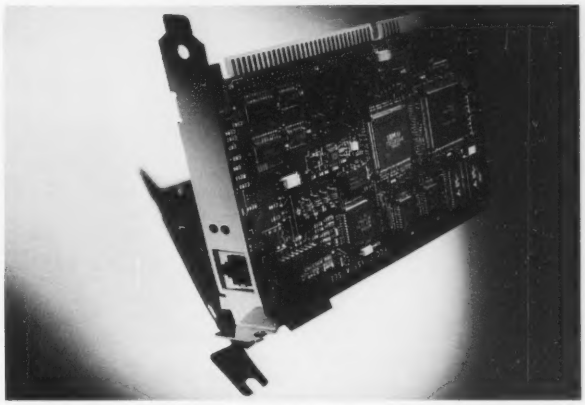


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HP keeps pace in PC race with aggressive price cuts

By Jaikumar Vijayan

Hewlett-Packard's Personal Information Products Group, which has emerged as one of the fastest growing companies in the PC business, will today take aim at industry price leadership with the announcement of a series of price reductions across its desktop lines.

Effective Oct. 1, prices on all HP Vectra models and several of its multimedia PCs will be reduced between 5% and 20%. For instance, an HP Vectra VL2 4/66-MHz model — with 340M bytes of disk and 8M bytes of RAM for a list price of $2,249 — will now cost $1,839.

The pricing changes will make HP competitive with other leading vendors such as Compaq Computer Corp. and IBM PC Co., although HP claims its price tags are lower than the others by 10% to 15%. The action comes at a time when PC sales have been booming for the company. HP recently shipped its one-millionth PC for the fiscal year, has been doubling its PC shipments every year and recently propelled itself into the Top 10 of the PC business.

"We are absolutely a growth engine for HP," said Jacques Clay, general manager at HP's PC division, last week. The PC business now ranks among HP's Top 3 business lines — up from nearly nowhere two years ago.

HP's plans call for strategic moves into the small office, home office and consumer markets, with products targeted specifically at those segments.

Possibly contributing to HP's gains were the supply problems that plagued other PC vendors such as IBM and Compaq during the past few fiscal quarters, analysts said. In fact, erratic product availability — particularly from the second quarter of 1992 into the last quarter of 1993 — probably allowed HP to establish a comfortable beachhead in the PC market, said Randal Giusto, a senior industry analyst at BIS Strategic Decisions in Norwell, Mass.

Yet as HP gets more into consumer and small business user markets, it will also have to get into traditional retail distribution channels and position itself as a serious desktop player, observers noted.

Hewlett-Packard

CONTINUED FROM COVER 1

ecutive officer in 1992. "We're never absolutely, totally satisfied with how we're doing. We always imagine we could be doing better, that the competition is catching up with us."

Some analysts said they believe HP is still relying on good product hunches about RISC, Unix and desktop printers made in the late 1980s. "They're riding the crest of a lot of good decisions that were made in the past," said Bill Moran, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

"The jury is out on some decisions they're making now because they have implicitly conceded they can't go forward with PA-RISC forever," he added.

Even though HP plans to release a full 64-bit PA-RISC 8000 chip in 1996, it will sell the 32-bit PA-RISC 7200 next year, as competitors such as IBM and Sun Microsystems, Inc. start selling 64-bit hardware, analysts said last week.

Navigating the installed base to an entirely new post-RISC platform in the late 1990s could be problematic, analysts said. HP's alliance with Intel Corp. to develop a microprocessor within four years — combining elements of both HP's PA-RISC designs and Intel's CISC Pentium chips — will not yield products until the late 1990s.

Heads up

In the meantime, HP must avoid bumping heads with systems integrators that are also business partners. In January, HP launched an outsourcing group; in the spring, it created a 4,000-member systems integration operation.

One way HP executives avoid surprises is to stay in close touch with the user base. To that end, the company holds seminars for the senior executives at customer sites and hosts teleconferences with hundreds of users simultaneously. Bernard Guidon, general manager at HP's Workstation Systems Group, said last week that HP's Advisory Council of top users worked so well at providing feedback that the process is being "cloned" to work on regional and local levels.

Analysts also noted that HP has been masterful at keeping users of its 60,000-plus proprietary HP 3000 midrange servers happy, even as some sites move to Unix systems.

Increasingly, HP is letting users provide feedback for product development. "They're learning how to handle the customer as well as being handled by the customer," said Ed Riedy, a manager at GTE Telephone Operations' information management group in Tampa, Fla., which has hundreds of HP Unix servers and a dozen IBM-compatible mainframes. "They're listening to us and reacting to us and providing special components, as needed," he said.

Boost in sales

So far, HP's business in printers, PCs and Unix systems is growing apace (see chart). Even the HP 3000 line has slightly increased sales. Yet HP is looking to expand its market share by targeting the installed bases of Sun Unix workstations, IBM AS/400s and Digital VAXs.

Microsoft Corp.'s Windows NT is also a possible draw for new customers. Although HP already offers NT — on its PC servers — the question is whether adding an NT port to HP 9000 Unix servers would add value, said Wim Roelandts, senior vice president and general manager at HP's Computer Systems organization. Also, he estimated it would take 30 to 50 engineers working full time to support that port.

Meanwhile, HP is angling to grow its customer base. It sold more than 1,000 of its year-old HP 9000 T500 Corporate Business Servers as part of a "mainframe alternative program" that targets mainframe sites with Unix servers. It has sold many more Series 800 servers as downsizing platforms.

The company has come on aggressively in X Window System terminals as it seeks to unseat Network Computing Devices, the worldwide leader in unit shipments. HP said it would also like to unseat $4.6 billion Sun with HP's $3.4 billion Unix workstation business. To grab a share of IBM's AS/400 base, HP is lining up software vendors to port AS/400 packages to HP servers.

Despite recent successes, past troubles are remembered. There was the early but bumpy transition to RISC technology in the mid-1980s and then the trimming of HP's multilevel bureaucracy in the early 1990s. The last reorganization was carried out with direct assistance from co-founder and then-chairman David Packard, whose 1950s-era office is still located at HP's corporate headquarters here, next to co-founder William Hewlett's. After some initial trimming, head count climbed to 96,200 last year and is presently at 97,900.

The current crop of HP executives remember the company's "burnt fingers" over the issue of migrating users from the complex old-style CISC chips to PA-RISC, Roelandts said. "We moved in the mid-1980s, and it took us five years," he explained. "It's not enough to have the hardware. It's a lot of work."

Although HP acquired Apollo Computer, Inc.'s workstation business in 1989, HP is still gently pushing those users to move to HP Unix workstations. But a stubborn and steady preference for Apollo-style text editing and distributed computing has bogged down those efforts.

Good returns

Still, these days the long-term investment is paying off — at the rate of $250 million a quarter in Apollo-to-Unix migration business, said Terry Bennett, director of technical research at Computer Intelligence/InfoCorp in La Jolla, Calif.

But HP cannot afford to count on an automatic migration to HP's Unix servers, users said.

"The critical sale is when companies buy their first Unix system. HP has to be available when the people are making those changes," said Doug Eltoft, president of InterWorks, Inc., an HP workstation user group.

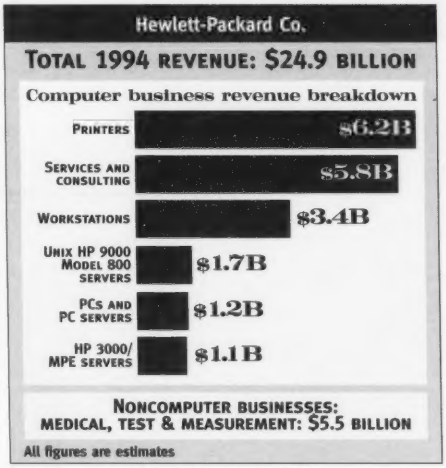
Some HP 3000 users made it clear that their options remain open. "Right now, we're in the process of doing a systems strategy plan, so we're looking at our alternatives," said HP 3000 user Bob Lewandowski, vice president of systems at ASAP Software Express, Inc. in Buffalo Grove, Ill.

Despite the challenges ahead, industry observers remain confident that HP will still be a computer giant by the end of the decade. "There have been bumps in the road, but they've dealt with it substantially better than anyone else in the business," said John B. Jones Jr., a vice president of research at Salomon Brothers, Inc. in San Francisco. "They're either good or lucky or both."

West Coast senior correspondent Mark Halper also contributed to this story.

On track

In the more esoteric realms of the business, HP uses its research labs to track new technologies for products. That approach leaves the vendor well-positioned to combine its expertise in hardware and communications to create a wide array of hardware appliances for the so-called information highway, said CEO Lewis Platt. Among such possibilities are printers that capture video images from TV set-top devices or handheld scientific devices that relay field data to corporate servers.



Source: Computer Intelligence/InfoCorp, La Jolla, Calif.

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Briefs

Imports up

U.S. exports of electronics products reached more than $48 billion for the first half of this year, compared with imports of $55.4 billion, according to an **Electronic Industries Association** study. U.S. exports increased by 16%, from $41 billion for the same period last year. Imports increased 18%, from $46.8 billion for the first half of last year.

Intuit posts loss

Financial and tax software developer **Intuit, Inc.** in Menlo Park, Calif., posted a loss of $10.3 million for the quarter ended July 31, compared with a profit of $100,000 for the same period last year. The loss included charges of $7.2 million related to Intuit's merger with **ChipSoft, Inc.** Revenue increased to $31.1 million compared with $20.3 million for the same period last year.

Sage re-engineers

Sage Technologies, Inc. in Stamford, Conn., has formed a new subsidiary, **Ameri-Data Consulting, Inc.**, which will provide business process re-engineering, systems analysis, technology management and other related services.

SHORT TAKES **Intersolv, Inc.** last week agreed to acquire **Software Edge, Inc.**, giving it ownership of the Defect Control System, which allows developers to track and manage software bugs. . . . **Platinum Technology, Inc.** in Oakbrook Terrace, Ill., will buy **Dimeric Development Corp.** in Woodland Hills, Calif., a maker of Oracle Corp.'s Oracle database reorganization and administration tools. . . . **Siemens Nixdorf Informationssyteme AG** in Paderborn, Germany, has invested $17.25 million in **Pyramid Technology Corp.** in San Jose, Calif., in exchange for 2 million shares of Pyramid common stock.

Cray rolls with supercomputing changes

Plant revamp will aid fast turnaround

By Craig Stedman

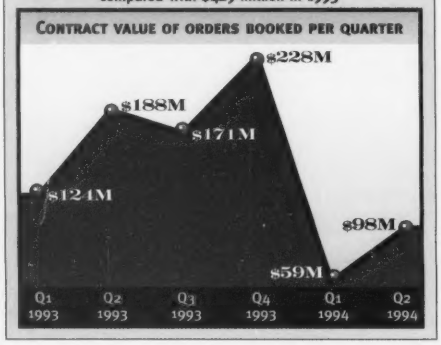
The changes afflicting the high-performance computing market as government demand declines and technology choices proliferate are forcing even supercomputer top dog Cray Research, Inc. to learn some new tricks.

Citing a need to expand sales of smaller systems to make up for flat revenue from its biggest supercomputers, Cray recently said it plans to temporarily shut down most of its Chippewa Falls, Wis., manufacturing plant in order to retool the facility for faster turnaround times on systems.

The staggered work stoppage will begin Oct. 10 and last four to eight weeks, although it is not expected to delay any scheduled 1994 deliveries to customers, Cray said. Once a new, more automated manufacturing process is in place, 382 of the 1,530 workers at the Chippewa Falls plant will be laid off, the company added.

Awaiting orders

A sharp decline in orders reduced Cray Research's backlog to $197 million at the end of June, compared with $429 million in 1993



Changing needs

The need to produce supercomputers more quickly — and to cut the cost of making them — is driven by the rise of massively parallel processors and increased competition from Unix systems and clustered workstations. "Our customers have choices today [that] they didn't have just a few years ago," wrote John Carlson, Cray chairman and chief executive officer, in a memo to employees about the upcoming manufacturing changes.

Cray said the retooling of the Chippewa Falls plant should reduce the manufacturing cycle on its high-end C90 systems from almost a year to 16 weeks. Turnaround times on the company's smaller machines, including the soon-to-be-announced J90, will go from two months to "a month or less," the vendor said.

Despite the layoffs, analysts said Cray Research is not in the same leaky boat as other high-performance computer vendors, such as spin-off Cray Computer Corp. and Thinking Machines Corp., which have been taking on serious water. Indeed, despite flat high-end sales, first-half profits for Cray Research increased a healthy 42% over 1993, while revenue rose 19%.

However, orders fell significantly in the first half (see chart). There were extenuating circumstances because of the timing of some large orders received in late 1993 and in July, and the drop-off has not hurt revenue yet because of the long lead times on supercomputers. But analysts noted that Cray is losing the luxury of being able to take orders up to a year before delivering systems — meaning it has to build them faster to avoid revenue hits.

"Cray had been in an incredibly comfortable position, but the world doesn't work that way anymore," said Jeffry Canin, a securities analyst at Salomon Brothers, Inc. in San Francisco. Even supercomputers have "become much more of a book-and-ship type of business," he added.

Cautious optimism

Terry Bennett, director of technical systems research at Computer Intelligence/InfoCorp in La Jolla, Calif., said Cray has been slow to update its manufacturing operations. "They still handcraft a lot of their work, and they shouldn't," he said. The retooling "is a very sensible step to take."

Cray has indicated that its ability to meet 1994 financial goals "is not without risk" because of the first-half order slippage. Canin agreed that while Cray appears to be weathering the high-performance storms in relatively good shape, "you have to keep a little guarded" on its short-term outlook.

EMC turns to video server storage

By Craig Stedman

Looking for ways to continue its meteoric sales growth despite increased competition for mainframe storage, EMC Corp. has started developing storage applications for video servers using microcode that sources said was licensed from Digital Equipment Corp.

EMC also hired six engineers who had been working on the microcode at Digital, according to the sources. Both EMC and Digital declined to comment on the deal, although a Digital spokeswoman said the company is talking with other vendors interested in pieces of its video server technology.

The spokeswoman added that Digital, which is one of several companies at the forefront of video server development, is "absolutely not abandoning" that emerging market. It continues to "invest heavily" in both the server technology and future video-on-demand applications, she said.

Biding time

EMC noted that it did not get ownership or exclusive rights to the microcode. The Hopkinton, Mass., vendor would not disclose a time frame for introducing its first video storage applications and said it depends "on when the market itself is going to be a reality."

The applications would enable EMC's mainframe and AS/400 disk arrays, plus an upcoming series for Unix systems, to work alongside video servers, the company said. The combined disk and software offering would be targeted at high-performance video uses across networks or on workstations.

Multiple options

Storing video data on disk arrays would allow multiple video streams to run at the same time, making it possible for more than one user to access a particular piece of video simultaneously, said James Porter, president of Disk/Trend. The data would be split up among different disks in the array and then put into buffers to create the multiple streams, he added.

Much of the early video server development has been for pay-per-view movie uses. But James Porter, president of Disk/Trend, Inc., a market research firm in Mountain View, Calif., said he also expects corporate applications to emerge that would require array-based storage such as EMC provides. Potential examples include video-based training and storage of CD-ROM libraries so that multiple users can access data simultaneously, according to Porter.

Some early products are already available, such as an array that Micropolis Corp. has sold to hotel chains for providing in-room movie selections, Porter said. "But that's merely a junior version of what will eventually be developed" as video servers move off the drawing board, he added.

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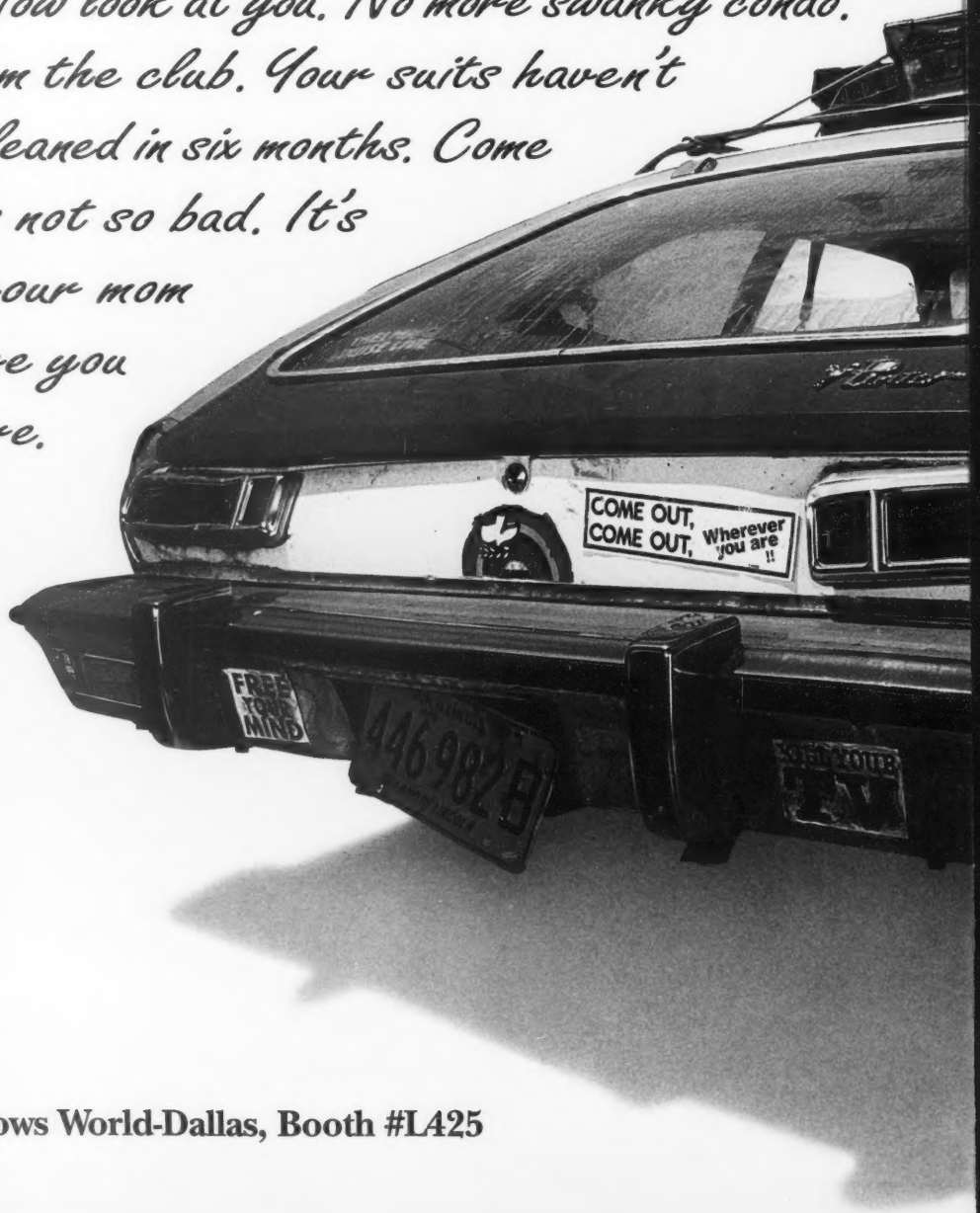
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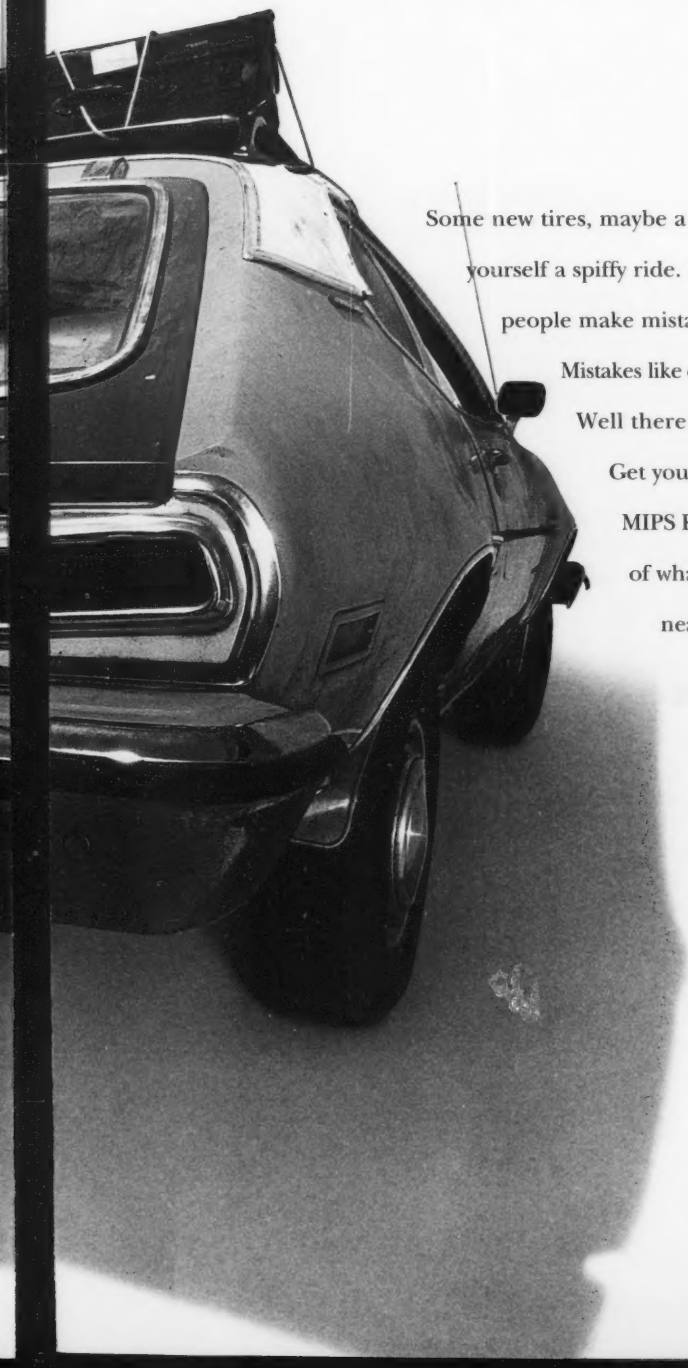


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Back to basics

The computer industry is on track to enjoy another record year.

Yet the U.S. Department of Commerce reported 10 days ago that service sector productivity actually fell at a 2.5% annual rate in the most recent quarter. That's nothing new: Nonmanufacturing productivity has been bumping along at the same level for more than 10 years while computer sales have skyrocketed.

For all the bucks corporate America is dropping on bits and bytes, there is still little hard evidence that the investment is paying off in productivity among so-called information workers. Sure, you can't very well do business today without computers, but that's hardly an argument for aggressive investment in the leading-edge stuff.

With this issue you'll find our seventh annual *Premier 100* magazine, a roundup of the public companies that deploy information systems most effectively. This year's *Premier 100* is a marked departure from our previous six efforts. Those rankings rewarded companies that, in our opinion, spent IS dollars most intelligently. Our revised methodology simply recognizes those who spend the least and have the biggest profits to show for it.

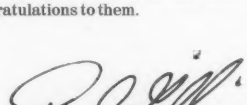


It's a simple model, but business these days is going back to simpler values: Deliver quality at a fair price, and do more while spending less. It's not rocket science, and our *Premier 100* IS executives will tell you that their job — delivering value to their end-user customers — is no different from the mission of any successful business.

Here's a profile of our average *Premier 100* IS executive: He (almost all of them are "he"s) believes that everyone who needs a PC should have one. He has one IS staff member for every 20 employees. His budget increased a healthy 8.4% this year. He reports one level below the chief executive officer. He has more than 20 years of IS experience but less than 10 years of formal IS training.

He's moving more and more spending authority out to user departments. He likes to do things himself. He doesn't trust outsourcing and doesn't spend much on outside services. He's enthusiastic about client/server, but he's not about to bet his job on the first client/server project. He spends less than half his software budget on maintenance. He is religious about return on investment. No new project gets started unless someone on the business side sponsors it. He doesn't particularly like to talk about his accomplishments because he considers what he does to be too strategic to the business.

Surprising? Not really. Productivity in IS is really no different from productivity in any other business. You block and tackle, watch your rear and justify everything in terms of business benefits. Our *Premier 100* IS departments are those who execute the fundamentals well. Congratulations to them.



Paul Gillin, *Editor*
Internet: *pgillin@cw.com*



Client/server reaps significant reward

Regarding the editorial "Client/server Q&A" [CW, Aug. 29]: Such cynicism! Our task is to *boldly* forge ahead into new and promising technologies. Are better corporate communications and uniformity of data "intangible" benefits? Costs will *never* decrease (without layoffs). As for your reply on LANs, credibility need not be an issue with the proper skills, procedures and equipment.

Certainly, the pathfinder client/server project in an organization should not be a mission-critical one. But already there are major industries using client/server in this fashion.

Perhaps if you had backed up your column with a few horror stories...

Len Thornton
Systems manager
President's Choice International
Buffalo, N.Y.

Weighing benefits

"No doubt about IT" [CW, Aug. 15] was a good review of our attempts at determining whether information technology adds value to the enterprise. To say that we continue to struggle with the same old tools spawned by our traditional links with the financial community is an understatement. I believe we need to continually force ourselves to look toward the corporate view.

One enterprise attempted to deal with information technology from a return-on-investment perspective. Another tried to look at portfolios, but because each portfolio was a bundle of applications necessary to keep a function running, who decides whether that function needs to exist at all?

The final company relied on a cost/benefit approach, but one that "provided us with a lot more detail than our previous way of doing a capital expenditure analysis." This suggests that the more detail, the more right the answer will be.

Also, a part of the information technology proposal sped up collections of overdue accounts. Is the enterprise creating its own problem by selling to those it knows will be late with payment?

We need to understand why this account is overdue and have the information in place to fix it. Perhaps a significant information technology case is not a "stovepipe" capital investment decision but rather one that presents the cost of achieving revenue with the current technology compared with the changes caused by a proposed new technology package. That is a step in the right direction.

Dave Kennedy
Beavercreek, Ohio

Welcome news about MS-DOS

"Few mourn DOS decline" [CW, Aug. 22] is good news, as Microsoft has only been playing catch-up ever since the advent of [Digital Research, Inc.'s] DR-DOS 5.0, now Novell DOS 7.0. Unfortunately, I don't believe Microsoft is serious. This is just another ploy to intimidate people to switch to Windows 95.

As for all that new 32-bit technology, I have a good working version called OS/2, which runs Windows and allows me to continue to use my Novell DOS 7.0. I didn't have to give up DOS or run somebody else's version just to use 32 bits.

Thomas J. Brown
New York

Users *are* IS

Bravo to Kate Colborn in "Grace under fire" [CW, Aug. 15] for her tactful mention of an IS taboo: the pervasive lack of people skills.

The fact is, with many of the technology battles behind us, IS in the '90s needs to focus more on customer service than new technology. IS management and staff must learn to respond to users' cries for help with greater sensitivity. Like it or not, users *are* the job of IS, not just some annoying distraction from it.

Matthew Conescu
Atlanta

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Technology disconnect — real world danger

Charles B. Wang

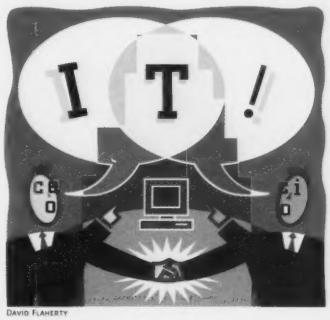
Necessity may be the mother of invention, but frustration is often the father of change.

In the past two years I have met with hundreds of corporate leaders from around the world, and I can report that we must be on the edge of a great era of change because when it comes to information technology, the frustration level of CEOs is stratospheric.

The consensus is startling:

- While information technology is often the largest single investment a company makes, few CEOs are able to quantify the results. Unlike other investments, the yield from information technology seems to defy measure. Increasingly, it seems to defy justification.
- Because many CEOs, if not most, are resigned to techno-illiteracy, they depend on resident technologists — usually at the CIO level — for critical decisions that may make or break the company. Unfortunately, as much as CEOs are unfamiliar with the technology, their CIOs are unfamiliar with the core business that technology is intended to support.

It is this "technology disconnect" that has caused such a strain between the business and technology sides of corporate life that it threatens the profitability of every company where it has taken hold. It is difficult to imagine any other result when we realize that the turnover of CIOs is among the highest for any executives.



DAVID FLAHERTY

With some CIOs lasting only two or three years, many information technology projects never come to fruition during their initiator's tenure. The replacement CIO is thus tempted to declare a problem (which makes sense because newer technology has now become available) and make major changes. These may or may not be fully implemented before the revolving door brings forth yet another CIO.

The effect can be disastrous. Once a company's information technology strategy becomes fragmented and ceases to function smoothly, managers may begin the finger-pointing and assigning of guilt that replaces the taking of responsibility. Meanwhile, employees find themselves untrained in the new system or cannot seem to get the new system working with what's left of the old. Nothing works.



When the frustration level reaches epidemic proportions, the CEO's reaction is often resolute determination to change the system once and for all. At this point a new CIO is chosen and typically ordered to clean up the mess by starting over. With the predictability of church bells on Sunday morning, the promise of new technology is heard in the corporation.

Faced with what amounts to technology-of-the-month, the CEO is likely to depend on his CIO as he wouldn't depend, for instance, on his chief financial officer. In fact, the normative response is to call in the resident guru, sign the check and hold one's breath.

The result of this revolving-door technology is that some CEOs have simply lost faith in the promise of computing. Yes, they'll say, information technology automates accounting and payroll and record keeping, but it has no potential for changing the way we do business.

Yet many of these same CEOs are aware that some firms have indeed remade themselves through information technology. Information technology has provided not only faster word processing and number-crunching but new ways of doing business and, not infrequently, entirely new and fruitful profit centers.

This troubling paradox — why them, not us? — need not remain a mystery forever. Companies that use information technology successfully are led by CEOs who have come to terms with it. They have not become technology experts but have absorbed enough of the basic terminology and concepts to at least rudimentally discuss the options with their CIOs.

Successful CEOs also refuse to look at information technology as a corporate black hole that sucks in money but whose effect can never be seen. Such CEOs are not afraid to ask simple questions: What does it do? How is that better than what we have now? Just what is the ultimate cost? Does this include retraining — typically several times the cost of the installation itself — or will training costs be tucked conveniently into someone else's budget?

How dependable is this system: 99%? What happens when the fateful 1% has its day? Is this new technology compatible with our old technology investment? What are the advantages of keeping our legacy system and upgrading it? What will we get for every dollar we invest? In other words, how will this help us be a more profitable bank, shoe manufacturer, airline, advertising agency or retailer?

By necessity, this means treating the CIO as a member of the business team and not a hired gun, a development that has positive consequences of its own: The CIO might well find that he or she is suddenly happy to be part of a corporation that values his or her contribution to income, not just to costs.

But the CIO has a responsibility, too, and that is to establish a career in business — not merely in technology — by fully joining the corporate team, even if it means putting aside the idea that new is best and revolutionary technology is ipso facto superior.

Having said earlier that frustration is the father of change, I should make it clear that when frustration brings about the wrong changes, the result is only more frustration. When frustration results in meaningful change, it is to be applauded — and so too will the CEOs and CIOs who bring it about.

Wang is chairman and CEO of Computer Associates International, Inc. and author of *Techno Vision, The Executive's Survival Guide to Understanding and Managing Information Technology*, to be published by McGraw-Hill Sept. 26.

Enterprise networking market: Chaos or clarity?

Gary Law

Many of the recent mergers in the networking industry have been driven by the same forces that brought together AT&T and McCaw Cellular Communications or spawned Bell Atlantic's attempt to merge with Tele-Communications. There has been a massive repositioning in the market caused by the advance of technology that speeds voice, video, data and images simultaneously over the same network.



The imminent marriage of SynOptics and Wellfleet clearly reflects this trend. However, it also represents the reality that critical mass, a comprehensive product portfolio based on emerging, high-speed technology and a standards-based architecture, will be necessary to meet customer requirements for faster, more flexible and easier to manage internetworks.

In the past 18 months, the networking industry has seen nearly a dozen sig-

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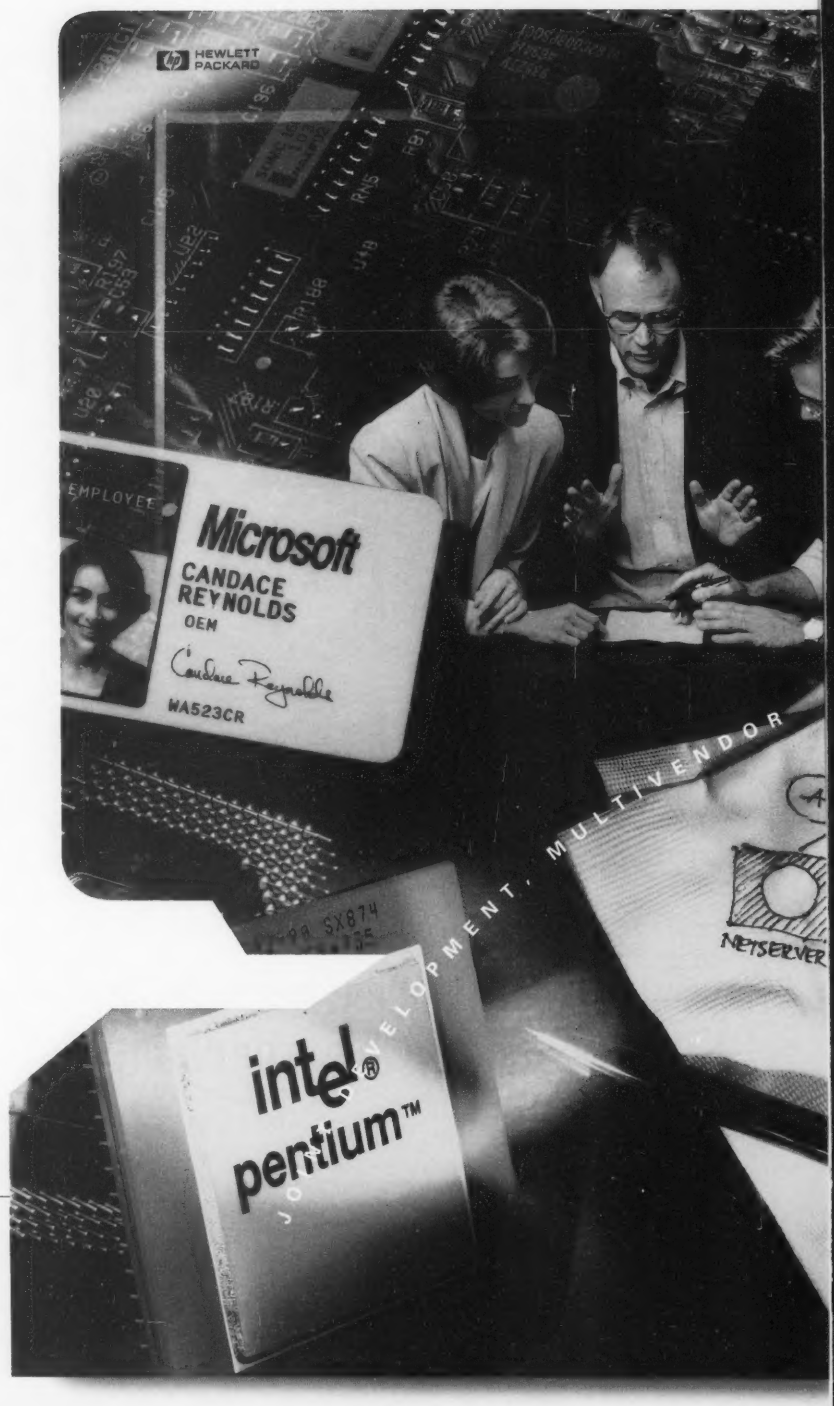
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23. Dir./Mgr. Sys. Development, Sys. Architecture
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Networking market: Chaos or clarity?

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nificant mergers or acquisitions, all driven by the need to meld critical network switching and routing technology into integrated solutions that will take customers into the 21st century and the world of switched internetworks.

This has driven to the altar companies such as Cisco and Crescendo, Bytex and Network Systems, Chipcom and David Systems, and 3Com and Synernetics.

To the untrained eye, all this activity appears to be nothing more than unleashed chaos. A closer look, however, reveals there is some method to this madness. New user requirements and the convergence of technology are shaping the market's future.

To the untrained eye all this merger activity in the networking market appears as nothing more than unleashed chaos. A closer look reveals there is some method to this madness.

This year the internetworking market, combining both the hub and router industries, will exceed $4 billion, marking the fact that client/server technology has come out of the closet. In addition, manufacturing revenue from companies that make LAN products is expected to exceed $13 billion this year.

Internetworking has become a strategic part of mainstream business operations and requires strategic networking partners with the resources, technology and expertise to build and support a company's global network.

Networking customers basically want the following:

- Better network systems capable of solving real business problems and supporting more robust applications such as groupware.
- A migration path to new high-speed technologies, such as Asynchronous Transfer Mode (ATM) and switched Ethernet networks.
- Investment protection for shared-media networks and older protocols such as Ethernet, SNA and DECnet.
- The ability to lower the overall cost of network ownership.

Users want all this at lower costs, with better performance and without being tied to a proprietary vendor architecture.

The answer to these issues lies in the advance and convergence of new high-speed networking technology — namely ATM, LAN or Data Link Switching — and high-speed virtual network routing (the ability to route data between logical LANs using a single router interface). Each of these technologies can solve a particular problem, but no one really addresses them all. To do that requires bringing together several technologies — where the sum is clearly greater than its parts.

For vendors to meet customers' future requirements for internetworks, these technologies must be implemented in the context of a single, manageable system that can be delivered at a lower cost to users. It is imperative that vendors have specific expertise in each of these areas, and as vendors quickly realize this, they scramble to get all the pieces in house.

Mergers will typically accelerate this process, providing the successful introduction of next-generation switched internetworks that meld these new technologies.

In fact, the single biggest benefit customers will derive from the SynOptics/Wellfleet merger will be a new networking system that combines the best-of-breed routing, switching and hubbing into a single, standards-based system.

Once the customer's needs are understood, the reasons for the consolidation in the networking business become clear.

Law is director of market development at SynOptics Communications, Inc. in Santa Clara, Calif.



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Scheduling software

Beta users applaud Lotus' Organizer improvements

By Lynda Radosevich

Lotus Development Corp. has significantly improved its Organizer scheduling software by filling in dozens of end-user functionality gaps, according to a handful of users testing Version 2.0, which is under development.

In addition, Lotus has added some Notes support and enhanced CC:Mail support in Organizer 2.0, according to company officials.

Lotus announced the new version last week at Networld/Interop '94 in Atlanta and plans to deliver it in the fourth quarter. Users said the improved version includes the following:

- Better printing support, which lets users print out their appointments in popular formats like DayTimers, Inc.'s day-planning books.
- The call management application linked with the address book and other modules.
- The ability to look at a whole month of schedules.
- More robust customization capabilities, which let users create different kinds of appointment categories.

About time

Organizer 2.0, which costs $149 per user, is the first major upgrade to the personal information management software in two years.

Print capabilities

"In 1.x, Organizer looked good on-screen, but it didn't print out as well as other programs," said John Taylor, manager of information systems at Savings & Community Bankers of America, a savings industry trade association in Washington. "The new version plugs that gap. I'm only in front of my PC for two hours a day, so I rely on the printed output."

Lotus did not change Organizer's notebook-style look, which is popular with users.

"The good news is they didn't mess up the interface," said Kent Soule, president of Soule-Microsystems, a consulting company in San Francisco.

Organizer 2.0 also allows users to grant other users varying levels of access to the same Organizer file. For example, an assistant can schedule appointments for an executive while the executive is editing the same file, according to the company.

One directory does all

On the workgroup side, Organizer can retrieve individual names from the Notes address book, eliminating the need to maintain a separate directory.

Lotus introduced a similar capability for CC:Mail last March. Users can schedule group meetings using Notes and CC:Mail as the transport for the meeting request messages. Also, mobile users can automatically merge their Organizer file with a network version.

However, while users contacted were happy with Organizer 2.0 as a personal tool, it still leaves room for improvement in group scheduling, according to Karl Wong, an analyst at Dataquest, Inc. in San Jose, Calif.

What is missing — as in the case of most electronic-mail-dependent group schedulers — is the robust wide-area network support and real-time scheduling that users of host-based messaging and scheduling systems have, Wong added.

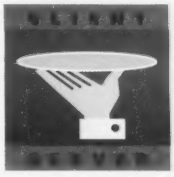
"I don't think that any of the LAN-based systems can do what you can do on single-box systems," Wong said, adding that the store-and-forward nature of E-mail can create delays in propagating scheduling information.

D&B unbundles platform duties

By Rosemary Cafasso

■ Dun & Bradstreet Software plans to soon unbundle some desktop functions from its SmartStream client/server platform and offer them to customers for less than a full-blown SmartStream end-user license would cost, according to users briefed by the company.

Doug Gosling, manager of financial systems at Ontario Hydro, last week said he had been told by D&B Software that components such as the SmartStream Analyzer, which allows users to dynamically view and manipulate data, would be available as a separately licensed product.



"It allows you to get some [SmartStream] capabilities into the hands of people without spending a fortune on the platform," Gosling said.

While customers negotiate individual client/server deals with D&B Software, additional SmartStream seats, or end-user licenses, can cost about $2,000, customers said last week. The users said D&B Software indicated that a separate license for SmartStream Analyzer would cost about one quarter of that amount.

Company officials last week declined to comment on unbundling plans. However, officials had previously confirmed more general plans to announce changes to its pricing structure. That action could come within several weeks.

The upshot to unbundling is that users could expand their SmartStream installations for much less money and give additional users only the functions they would actually use.

Bob Culmer, director of information technology at Phillips Cables Ltd. in Toronto, said he had also discussed plans with D&B Software to unbundle the Analyzer component. Phillips Cables is moving to FinancialStream 2.0, a set of financial applications D&B Software announced last month.

"I thought it was silly to pay so much money when you have a lot of execs who want to view and analyze, [but] they don't need to be SmartStream users," Culmer said. The unbundling "would be a cost-effective way for me to roll out the decision-support capabilities to the company without incurring the costs of [adding] a mainstream general ledger user."

Observers called the plan a smart move for D&B Software because it is getting kicked around by rivals and should do more to leverage its strengths. Analysts said SmartStream's end-user functions as well as its workflow and ad hoc capabilities are ahead of such rivals as Oracle Corp. and SAP America, Inc.

IBM offers 'Warp' speed access to the Internet

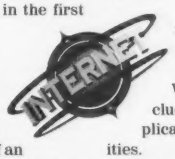
By Ed Scannell

Trying once again to outflank Microsoft Corp. in the operating systems war, IBM has released beta versions of tools that give OS/2 users bundled-in access to the Internet.

When IBM ships Warp, the 4M-byte version of OS/2, next month, it will offer users an "on-ramp" to the information highway by providing several utilities in a BonusPak of OS/2 applications.

These utilities will include Gopher, which permits access to a range of information servers to view graphics and text; Telnet, which gives users access to remote data libraries such as the Library of Congress; and a comprehensive electronic-mail package.

Microsoft officials have promised that similar capabilities will be built into its next version of Windows, now called Windows 95, which is expected in the first half of next year.



Supply for demand

Besides trying to beat Microsoft to the punch, IBM decided to bundle the utilities with Warp in part because of an outside researcher who received thousands of questions from users asking how they could access the Internet.

"We received about 13,000 questions from business executives in the first quarter of this year, and the No. 1 topic is the Internet," said Andrew Garvin, president of Find/SVP, a New York-based researcher.

Some users appear more interested in IBM's Internet connection than in some of the other applications in the Warp BonusPak, which includes a suite of productivity applications and various desktop utilities.

"We don't have any burning needs for this now, but I can see where in the future it will be pretty valuable. There is a lot of stuff on-line in the transportation business that can't easily be accessed unless you have a set of integrated tools like this," said Todd Pool, a programmer at Gemini Transportation, Inc. in Houston.

Some others, mostly larger accounts, said the new utilities are redundant and could even cause technical conflicts with what they have.

"It is not really the kind of built-in convenience we need. It tends to cause problems with the networking things we already have in place," said Virgil Pittman, information systems manager at The Fireman's Fund, Inc. in San Francisco.

With these utilities, Warp users will have one-button access to the IBM Global

Warp, *page 46*

Standard to aid telephony integration

By Ellis Booker

Even as user enthusiasm for integrated applications grows, the two most used desktop devices — the computer and the telephone — continue to work in annoying isolation.

That is changing, however, thanks to several standards efforts for linking these two ubiquitous systems on the desktop.

On one hand, there are application programming interfaces (API) to control telephony resources on the desktop. This is the focus of several efforts, notably Intel Corp./Microsoft Corp. Telephony API (TAPI), Apple Computer, Inc.'s Macintosh Telephone Manager and AT&T Corp./Novell, Inc.'s Telephony Services API for connecting LANs with digital switching systems.

On the other hand, an even more promising but less publicized standard for server-based solutions is gaining momentum.

Trio of buses

The software component of SCSA includes service provider interfaces to three hardware bus standards: the SCSA hardware model, the Multi Vendor Integration Protocol from Natural Microsystems ID and proprietary hardware bus platforms.

Received backing

The Signal Computing System Architecture (SCSA) has garnered support from more than 230 top computer and telephony hardware and software providers. Unlike the client-centric APIs, the SCSA seeks to provide interoperability of server applications across a wide range of media types.

SCSA was spearheaded last March by Dialogic Corp. in Parsippany, N.J., a leading maker of voice-processing interfaces. SCSA is a distributed API split between a hardware specification and a software API. The hardware level ensures interoperability among signal computing hardware from multiple vendors; the SCSA Device API is an interface to call control and media processing applications.

"This supports all media, whereas the others support just call control. ... It's the only thing out there that ties everything together," said Jim Burton, president of C-T Link, Inc., a Boston-based consultancy specializing in computer/telephony integration.

Burton said he expects SCSA-compliant products to ship in the first part of next year, with mainstream applications appearing in the spring.

In fact, SCSA-based hardware announcements have already begun. Last month, for instance, Hewlett-Packard Co. announced plans for SCSA support using Dialogic equipment on its Intelligent Peripheral, a hardware platform for telephone companies due out by year's end.

Software-compliant SCSA applications are due to show up after the draft specification of the SCSA Telephony Application Object Framework is published later this month.

"We'll see many more mid-size companies taking advantage of these [voice-processing] technologies and, from our point of view, taking advantage of speech recognition," said Jeff Hill, vice president of product development at Voice Processing Corp. in Cambridge, Mass.

However, even though Hill sees the SCSA and TAPI as targeting quite different markets — one for high-end, multiple-server, multiple-line installations and the other for individual desktops — he would like to see the two standards relate to each other. "It would help if these things were close to the same because it would make it easy for developers," he said.

Meanwhile, Burton is spying an intriguing application for SCSA-based servers: private branch exchange replacements.

"I think we'll see companies using SCSA architecture for integrated solutions that include providing the telephony function," he said, noting that the SCSA hardware standard includes a switching matrix that could "give you a pretty good-size telephone system."

Happy campers

While it is mostly developers who are cheering the arrival of telephony APIs, end users are happy, too, about easier-to-use development tools for creating telephony applications.

One of the latest of these development tools is the Visual Voice tool kit from Stylus Innovations, Inc. in Cambridge, Mass. Visual Voice, an interface for Microsoft's popular Visual Basic, provides a graphical development platform for Windows-based telephony applications.

Pennsylvania State Credit Union in Harrisburg, Pa., is using Visual Basic and Visual Voice to develop a system to track shareholder votes for its board of directors elections. "Our annual election involves a mailing to 200,000 members at a cost of $100,000-plus," said credit union President Gregory Smith. Smith said he expects the voice response application, which is being developed in-house for use early next year, to save $60,000.

At the high end, Visual Voice supports Dialogic Corp. interface cards. Last month, Stylus announced support for sound boards that use IBM's Mwave digital signal processor technology.

Visual Voice for Mwave sells for $495 or can be purchased with an Mwave-based sound board for $695. The software requires a 486SX or higher chip and Windows 3.0 or above.

—Ellis Booker

Briefs

Stac for Windows

Stac Electronics said it will ship a version of its Stacker data compression utility for Windows 95 within 90 days after the operating system ships next year. Windows 95 is the new name Microsoft Corp. has given to its next major release of desktop Windows, which was previously code-named Chicago.

Multimedia update

Microsoft said it is shipping an update to its multimedia word processing package that combines Word 6.0 for Windows and the multimedia version of Microsoft Bookshelf '94. The package, which comes on a CD-ROM, costs $399, with upgrades from current versions of Word and Bookshelf costing $149. Upgrades from competitors' word processors also cost $149.

Microsoft extends its support hours

By Stuart J. Johnston

As part of its move to expand into the world of enterprise computing and server technologies, Microsoft Corp. has been quietly reorganizing its technical support group to provide the kind of support that traditional information technology organizations have come to expect.

Microsoft Premier support subscribers can now get technical support 24 hours a day, seven days a week — an option that Microsoft recently added for its Solution Partner resellers, worldwide authorized support centers and corporate accounts.

"Our problems don't exist between 8 [a.m.] and 4 [p.m.]" because information technology specialists typically have to do software maintenance, upgrades and new installations after office hours, said Briscoe Stephens, coordinator for space sciences at NASA's Advanced Scientific Information Systems Group in Huntsville, Ala.

For Stephens to pay five employees to be authorized to call Microsoft anytime is equivalent, when all costs are considered, to paying each for an extra five minutes a day — a total of about $25,000 a year.

"That's a lot cheaper than $450,000 per year [for some types of mainframe support]; it's a lot easier to call Microsoft than [to pay an employee for the time required] to go through three or four manuals," Stephens said. "It's a very cost-effective way to have instant expertise."

"It's clear that when you buy a server product, you're buying a platform, so service is important," said Sam Jadallah, general manager of corporate support at Microsoft's Product Support Services organization. "You're looking beyond the particular version [of a product] and looking to a three- to five- to 10-year standardization."

Always in reach

Customers appreciate the ability to call in the middle of the night or on weekends and speak to a support engineer who will help them with a sticky problem or a failed server. In this worst case, Microsoft technicians will work around the clock until a problem is resolved, according to both Jadallah and customers.



Microsoft's Sam Jadallah: *Technicians will work around the clock to fix problems*

"In every case they don't have all the answers — nobody does — but they never say, 'I'm sorry, I can't help you,' like a lot of other people do," said Craig Restle, president of Systron, Inc., a Microsoft Solution Partner in New York.

"We've always gotten a [problem] resolution, [even when] sometimes it takes hours and several people," Restle said. "They're just like a dog after a bone."

Restle, whose company is also a Novell, Inc. Platinum reseller, said both companies offer excellent support. However, when one of his 24 engineers has to call Microsoft, he finds it reassuring to reach a support person right away.

"With Novell, you frequently leave a message, [and] they get back to you." While that usually works fine, "you cringe when you're at a data center waiting for them to call you back and someone else needs to use the phone," Restle said.

Worth the cost

Pricing for Microsoft's 7x24 Premier Support contracts varies and can be expensive, but Restle is not complaining.

"We tend to use the Microsoft support more than the others, so we've really gotten our money's worth," Restle said.

Internally, Microsoft has three levels of specialists to handle customers' problems, with escalation to the next level in each case until the problem is solved.

At the highest level, customers have access to the developers of the particular system or server, such as Windows NT or SQL Server. That level of service is one thing large-scale users expect from vendors and something that Microsoft recently realized it needs to provide.

PeopleSoft answers 4 critical client/server questions. (No asterisks, no equivocations.)

1. How many years of client/server experience do you have?	6
2. Do you have both financial and human resources applications available and in production?	Yes
3. Are all your applications developed from the ground up for client/server?	Yes
4. How many RDBMS platforms do your applications run on?	6

Ask other client/server vendors those questions. You'll find that most of them are still new to client/server. And not prepared to support you in a client/server environment.

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Warp

CONTINUED FROM PAGE 43

Network, which Advantis will manage. Advantis is a partnership formed by IBM and Sears, Roebuck and Co.

Good intention

IBM also announced its intention to deliver a graphical web browser, called WebExplorer, which will be available to beta users in three or four weeks over electronic bulletin boards at no charge, a company spokesman said.

WebExplorer lets users move throughout the Internet with a graphical user interface designed to glue together the functions of services such as Gopher, Telnet and the file transfer protocol. Users who prefer not to use WebExplorer can still access the Internet through the individual icons for those functions.

To get onto the Internet via Warp, users click on the Internet folder, which initiates the onetime registration process and connects them with the IBM Global Network. As an introductory offer, users get 10 free hours of connect time.

Warp's E-mail capabilities will include IBM's UltiMail product, which lets users send and receive animated graphics and bit-mapped pictures as well as text through the Internet.

AMD chip fills gap in Intel line

By Michael Fitzgerald

■ Intel Corp.'s competitors may finally have a way to take advantage of the big chip maker's push to Pentium.

In March, Intel announced a high-end 486, the 33/100-MHz DX4. At the time, Intel anointed it as the mainstream desktop chip for 1994. But the company's decision two months later to shove aside the 486 in favor of Pentium put the DX4/100 low on its list of production priorities. The shift stunned some major systems vendors [CW, May 10].

As a result, numerous DX4/100 boxes that were announced have never really appeared. But competitors such as Advanced Micro Devices, Inc. (AMD) and Cyrix Corp. have not been in a position to offer their own alternatives, in part because they have lacked manufacturing capacity.

AMD says it finally has enough capacity to release a 33/100-MHz 486 clock-tripler that fits between the 25/75-MHz DX4 and the 60/90-MHz Pentium. Intel has staked this part of its market to the 60-MHz Pentium processor.

AMD disclosed its clock-tripler, due out in the fourth quarter, in conjunction with its recent announcement of a 40/80-MHz clock-doubling 486 processor, which fills a gap left open by Intel.

"AMD is going to have a fairly hot product," said Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz. McCarron said AMD should be able to leverage Intel's about-face on the DX4/100. "It's almost like Intel primed the pump for AMD," McCarron said.

Let's make a deal

Users say they will take whatever the best price/performance deal is, and for many, that means the 486 for now.

Pentium "is a pricing issue to us," said Ed Dombek, information center manager at Trustmark Insurance Co. in Lake Forest, Ill. Dombek said that once Pentium prices fall close to current 486 pricing, he will quickly move to Pentium. But his plans for the fourth quarter right now are to buy 486s, preferably based on the DX4/100.

Randal Giusto, an analyst at BIS Strategic Decisions in Norwell, Mass., said AMD's best shot is in the notebook market, Pentium's weak point.

"Depending on Intel's Pentium pricing, the desktop may or may not be there, but the portable market will definitely be a volume market for DX4/100s," Giusto said.

Currently, most of Intel's DX4/100s have been targeted to notebook vendors. But the product is not being produced in large quantities, and Carl Everett, Intel's senior vice president at the microcomputer products group, said recently that Intel does not expect to generate enough volume to bring the DX4/100 to the desktop until the first quarter of next year.

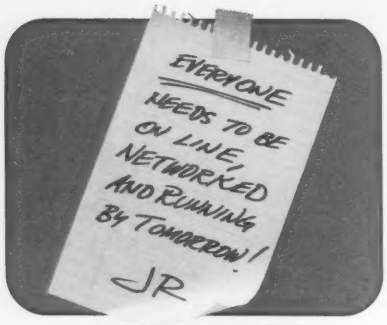
If AMD has a window in the market, it may be a slim one. Users contacted say they are looking seriously at moving to Pentium as Intel begins producing 60/90-MHz and 66/100-MHz Pentiums.

At Eaton Corp. in Cleveland, fully loaded 486s are "the minimum system we buy" as purchasing begins to shift to Pentium, said Fred Zickert, manager of microcomputer support.

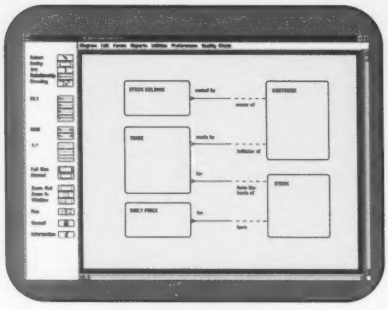
Room for two

Intel will be able to produce only 130,000 50/75-MHz Pentium chips for the notebook market this year, according to Mercury Research. This leaves a large window of opportunity for the 33/100-MHz DX4, analysts said.

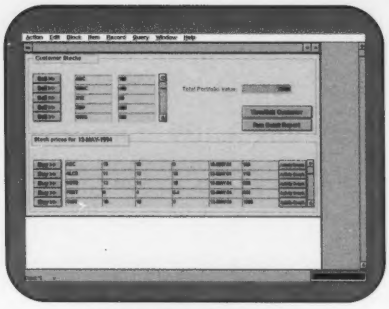
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New Products

Apex Data, Inc. has announced the Cellular Direct modem, a PCMCIA modem.

According to the Pleasanton, Calif., company, the Cellular Direct modem was designed for plug connection to the data access port of a cellular phone and eliminates the need for data interface boxes for connectivity and dial-tone simulation.

The modem provides data transmission and reception via a portable computer or cellular phone. It stores information about the user's phone in read-only memory so it can instantly recognize the type of phone and provide the dial tone.

The Cellular Direct modem costs $329.

▶ *Apex Data*
(510) 416-5656

Apple Computer, Inc. has announced TapWorks, FormPad, Great Meetings and Diet Logic, applications for the Newton MessagePad.

According to the Cupertino, Calif., company, TapWorks integrates spreadsheet capabilities with more than 100 built-in functions. FormPad lets users create custom forms on a PC and download them to the Newton MessagePad.

Great Meetings provides agenda preparation, time goals, notes and scheduling for meetings. Diet Logic lets users set goals for diet and health improvement.

Great Meetings costs $69, and TapWorks, FormPad and Diet Logic cost $119.

▶ *Apple Computer*
(408) 996-1010

Smart Modular Technologies has announced the ST288VFC data/fax modem PCMCIA card.

According to the Fremont, Calif., company, the ST288VFC provides error correction, data compression, auto dial, auto answer and a fallback capability for compatibility with slower modems.

Full-duplex communication is available at speeds of 28.8K bit/sec., with fax transmission rates of 14.4K bit/sec. The card is compatible with many communications application software packages that support the standard EIA/TIA-578 Class 1 and Class 2 command sets.

The product includes a sleep mode that removes power from most of the card's internal circuitry to extend battery life, which is exited when a read, write or ring signal is detected.

The ST288VFC costs $499.

▶ *Smart Modular Technologies*
(510) 623-1231

Micro Express has announced the Regal/Multimedia/P90, a 90-MHz Pentium-based portable multimedia PC.

According to the Granda Hills, Calif., company, The Regal/Multimedia/P90 includes 8M bytes of RAM, 512K-byte RAM cache, a 420M-byte hard drive, a VL-bus hard disk controller, a video card, a Toshiba Corp. CD-ROM drive, a MediaVision Spectrum 16 sound card, two stereo speakers, DOS 6.21 and Microsoft Corp.'s Windows 3.1.

The video driver can drive the LCD display and an external Super VGA monitor simultaneously. A clock/calendar and built-in diagnostics are also provided.

The Regal/Multimedia/P90 costs $5,699.

▶ *Micro Express*
(818) 368-8212

Rancho Technology, Inc. has announced the RT7000, a 16-bit PCMCIA SCSI card.

According to the Ranch Cucamonga, Calif., company, the RT7000 operates on any Type II or III PCMCIA slot and lets users attach as many as seven SCSI peripherals, including CD-ROM drives, fixed disks, scanners, optical jukeboxes, erasable optical, write-once read-many and tape drives.

The RT7000 was designed to operate on very low power and comes with active SCSI terminators that sense whether to activate the card.

The RT7000 costs $220.

▶ *Rancho Technology*
(909) 987-3966

Kantek, Inc. has introduced the Spectrum 3-D Wireless Ringmouse, a three-dimensional wireless mouse.

According to the East Rockaway, N.Y., company, the Spectrum 3-D Wireless Ringmouse is a pointing device that works on a user's finger and uses infrared and ultrasonic technology to track finger movements in front of the monitor and control the pointing arrow on the screen.

The product plugs into any serial port, and a low-voltage chip drives the infrared and ultrasonic controller, which operates on power from the PC.

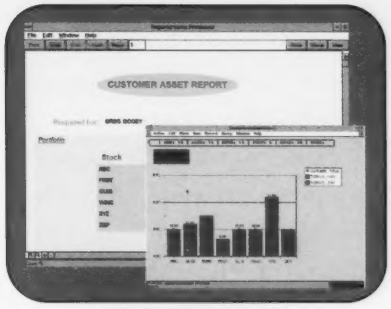
The Spectrum 3-D Wireless Ringmouse costs $99.

▶ *Kantek*
(516) 593-3212

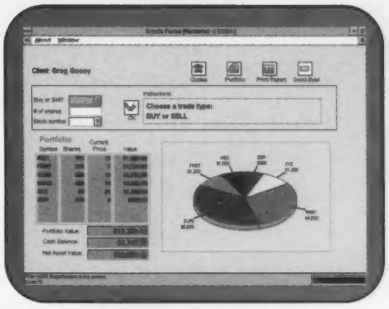
Product short

Klynas Engineering has introduced Streets on a Disk 6.0, road mapping software. The product lets users display detailed road maps and includes map searching capabilities and a router for travel directions and distances. It can also display database addresses along with text and scanned images. Cost: $225. Klynas Engineering, Simi Valley, Calif. (805) 583-1133.

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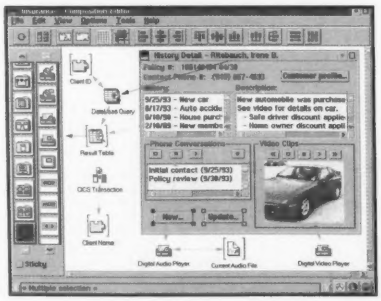
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Users watch, await power server maturity

By Jaikumar Vijayan

The recent flurry of high-end server announcements from vendors such as Compaq Computer Corp., Hewlett-Packard Co., AST Research, Inc. and Zenith Data Systems indicates these vendors may be seriously going after the database and application server markets, industry analysts said.

The systems, most of which are multiprocessor-capable, support 256M to 1G bytes of RAM and have up to 10G bytes of disk storage and optimized disk and network I/O architectures. They feature redundant arrays of inexpensive disks, server management and diagnostic software support.

The question is whether users really want the systems now. While the announcements clearly have piqued user interest, few seem in a hurry to purchase additional processors. Others are waiting until operating systems support becomes more widely available on multiprocessor platforms.

Support comes first

For instance, while users such as Aijaz Nawdhia, a LAN administrator at Burger King, Inc. in Miami, acknowledge that dual-processor systems make sense, they are not quite prepared to slap on the additional horsepower without adequate operating system support.

"We have looked at dual-processor systems and tried running our applications on them, but the operating systems just weren't there," Nawdhia said. If they did be-

Power servers, *page 52*

Wabi gets 'interface-lift' to enhance user appeal

By Jean S. Bozman

Wabi, Sun Microsystems, Inc.'s Windows-on-Unix answer to Microsoft Corp.'s lock on the Windows interface, will be revised in November to support more applications, according to Sun.

Wabi 2.0 will be a major revision of Sun's Windows translation interface, which industry analysts said has had very limited appeal, even at Unix sites, because it supports too few Windows applications.

SunSoft, Inc., Sun's software arm, recently said it had shipped 100,000 copies of Wabi as a no-charge item with Sun's Solaris 2.x operating system. It introduced Wabi 1.1 last spring to correct bugs that, according to some users and analysts, caused certain applications to slow or stop.

IBM and Hewlett-Packard Co. have shipped Wabi 1.1 since April with their Unix workstations, but they charge a fee for the SunSoft-supplied software module. HP charges $395 for Wabi 1.1, while IBM charges $249. The Santa Cruz Operation and Novell, Inc. are set to resell Wabi 2.0 with their Unix operating systems, Sun said.

Out of eight sites surveyed in recent weeks, few showed enthusiasm for Wabi 1.1.

"Although it did emulate most of the functions properly, it was too slow to use," said Pompi Malik, MIS director at Brewers Retail, Inc., a beer distribution chain in Mississauga, Ontario. "And a lot of the applications we use are not supported within the Wabi environment. So people still have two machines [a Unix workstation and a PC] on their desk, but we are hoping for a neat solution in the future."

13 going on 20

Andy Halford, director of engineering at SunSoft's PC Desktop Integration unit, said 13 major Windows applications have been certified for use with Wabi 1.1, and seven more are on the way in Wabi 2.0, including Lotus Development Corp.'s CC:Mail and Intuit, Inc.'s Quicken. "We found that those 13 applications account for over 60% of the shipments of PC software to the Fortune 500 companies," Halford said. "If you hit 20 applications,

Wabi, *page 53*

Off to a slow start

Wabi, introduced in May 1993, was revised last spring as Wabi 1.1 to handle bug fixes and performance problems, analysts said. Wabi 2.0, which supports 20 Windows applications, is expected this fall.

Middleware

IBM MQ series plays PeerLogic Pipes

By Elisabeth Horwitt

On the eve of the first meeting of the Message Oriented Middleware Consortium, middleware vendors announced initiatives that should make it easier for users to integrate their products.

Middleware, in this context, provides an underlying platform that enables an application on one system to request information or initiate a task on another system. Such products address a growing need at corporations to share information among departments, which may have very different combinations of client and server systems and transport protocols.

IBM and PeerLogic, Inc. in San Francisco announced that IBM's Message Queuing (MQ) series will work with PeerLogic's Pipes, so users can combine the two products' complementary features.

In particular, the MQ series provides an asynchronous message-queuing capability, which enables one system to query another without needing to ensure first that that system and the link to it are up and running, vendor spokesmen said. Pipes uses a synchronous communications paradigm that requires an ongoing session between the two interacting systems.

Fluent translation

Conversely, the MQ series running on Pipes will be able to take advantage of the middleware platform's ability to automatically translate between different operating systems and transport environments. Pipes will also provide the MQ series with dynamic rerouting around failures, said Steve Craggs, IBM's MQ series product manager. The MQ series runs over a variety of transport protocols and a growing number of IBM systems but does not provide translation between them.

In addition, melding the two products should make it much easier for users to develop middleware applications, said Mitch Kramer, a consulting editor at the Patricia Seybold Group, a consultancy in Boston. "The most difficult aspect of MQ Interface is designing the network going between queues and channels; putting Pipes in should simplify that," he said. Conversely, MQ Interface provides a higher-level interface for applications programmers, shielding them from communications underpinnings that Pipes' interface deals with, Kramer added.

One limitation is that applications written to Pipes cannot take advantage of the MQ series, a PeerLogic spokeswoman said. The MQ series is the higher-level interface, so applications written to IBM's middleware can run over Pipes but not vice versa, she said.

This is unfortunate for the Chicago Mercantile Exchange. The exchange is setting up an MQ Interface-based application to collect transactions from some 75 to 80 clearinghouses, according to Steve Goldman, manager of technical planning for the futures exchange. The problem is that the organization is using Texas Instrument, Inc.'s Information Engineering Facility (IEF) computer-aided software engineering tool, which uses Pipes, he added.

"We don't want two message manager types of functionality on our OS/2 and MVS platforms," Goldman said. The Chicago Mercantile wants to use IEF to develop middleware across Pipes, and this, evidently, will not be possible even with the new integration of the two platforms.

IBM also announced it is purchasing EZbridge, middleware from Apertus Technologies, Inc./Systems Strategies that can talk to MQ series-based systems. EZbridge runs on a variety of non-IBM systems, including varieties of Unix and Digital Equipment Corp. VMS and Ultrix. IBM will sell both the MQ series and EZbridge under its own logo, providing customers with a one-stop middleware shop as well as its own support.

In addition, IBM plans to expand the MQ series' platform support to OS/2 and AIX later this year and to other Unix systems next year, Craggs said. The MQ series runs on IBM MVS and AS/400 systems.

Sweet harmony

IBM and PeerLogic claim that the integration of Pipes and the MQ series will give customers the following capabilities:

- Time-independent processing that provides asynchronous and deferred delivery transactions.
- Fully transactional messaging that ensures information is reliably stored and recoverable.
- Greater access to transactional systems.
- A single logical network view.
- Enhanced network administration.
- Advanced network support.

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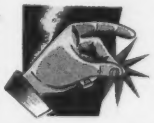
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When's the best time to upgrade your network and get a $4,700 workgroup productivity pack, Free?

NetWare

Cyrix offers open standard

By Jaikumar Vijayan

Users thinking of slapping two or more processors into their Intel Corp. server boxes may not have to be tied to the chip giant's Pentium line if a new multiprocessor architecture from Cyrix Corp. gains wider acceptance.

Cyrix last week announced its SLIC/MP open interrupt architecture for multiprocessor desktop systems that will support x86 and PowerPC implementations. The architecture's specifications will allow PowerPC as well as other RISC/CISC architectures to be implemented on standard desktop servers. Cyrix said the specs have already been endorsed by several companies, including IBM Microelectronics, Motorola, Inc. and about 12 chip set vendors.

Analysts, including Dean McCarron at Mercury Research in Scottsdale, Ariz., said Cyrix's new "open" architecture could be a move to counter Intel's closed Advanced Programmable Interrupt Controller architecture for multiprocessor systems. While Intel's interrupt controller locks OEMs and systems integrators into its processor road map, Cyrix's multiprocessing architecture will accommodate several processor implementations and types, McCarron said.

The SLIC/MP, which can be integrated into existing single-processor chip sets, will be made available to vendors and systems integrators, without patent or licensing restrictions, royalties or licensing fees.

Power servers

CONTINUED FROM PAGE 49

come available, he said he would consider the option.

At the same time, Nawdhia, who uses Compaq servers for most of Burger King's major applications, said he is confident that PC vendors such as Compaq can move further up the enterprise with their architectures. As features such as hot-pluggable drives, remote diagnostics, server management software and "increasingly smarter databases" become widely available, "the gap between PC architectures and those from companies like Tricord is going to narrow," Nawdhia said.

Michael Parrott, a LAN administrator at Restaurant Services, Inc. in Miami, has not yet reached the performance plateau on his PC servers, nor does he expect to yet. So far, he has upwardly scaled his servers by adding memory, controllers and mainly "configuring the system sensibly," he said.

Still, Parrott said he wants to see more multiprocessor technology on Intel Corp. architecture. "Multiprocessor doesn't mean anything yet unless you are going to use Windows NT. Even then, you are going to be breaking new ground," he said.

All in the approach

A lot will depend on how traditional PC vendors approach database and application server markets, analysts said.

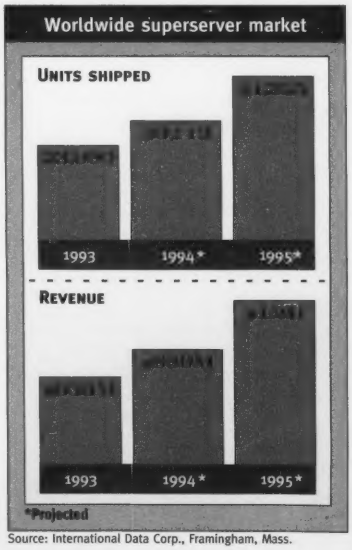
"If you are going to put your database on a PC server, you want to feel very well-protected. Vendors have to guarantee availability, security and reliability. They really have to make it bulletproof to get users to migrate all that stuff off mainframes," said James Greene, an analyst at BIS Strategic Decisions in Norwell, Mass.

Analysts, such as John Daly at Summit Strategies in Boston, said there are other issues. "The channels also are very different. There are a lot more distribution, support and service issues that need to be addressed here," compared with the PC market, Daly said.

There are indications that the migration to database and application servers may have already begun. A late 1993 study by Summit Strategies on the database and application server market revealed that the most significant growth for superservers will come from database and related application servers.

Almost 60% of corporations are either piloting or beginning to implement client/server projects, and a growing number of them are moving into full-scale deployment. The report suggested that by year's end, superserver users will expect a major portion of their systems' processor performance to be dedicated to running databases rather than operating systems.

Summit predicts that Microsoft Corp.'s Windows NT Advanced Server will become one of the major operating systems on multiprocessor platforms.



Source: International Data Corp., Framingham, Mass.

Cheyenne leaps into hierarchical storage ring

By Tim Ouellette

Cheyenne Software, Inc. is hoping its reputation and position in backup utilities will help its expansion into full-fledged hierarchical storage management (HSM).

Like other products entering the market from competitors Alphatronix, Inc., Conner Peripherals, Inc. and Palindrome Corp., Cheyenne's Hierarchical Storage Manager 1.0 automatically moves lesser-used files from primary storage on a server to lower-cost secondary optical or tape storage devices. This lets users directly access these files instead of waiting for an administrator to restore an older file from primary backup.

Bob Abraham, an analyst at Freeman Associates in Santa Barbara, Calif., said the key advantage for Cheyenne is its backup utility, Arcserve. "Users will say that these are the guys that invented Arcserve, so they will understand what will take place when you drop an HSM product into the system," he said.

Hierarchical Storage Manager does not require a terminate-and-stay-resident program on the client workstation, so users can use any Novell, Inc. NetWare client available. The system offers a choice of magnetic, tape or optical device types at each level of the hierarchy below primary storage. This flexibility lets administrators design their own storage management system.

The product has a Windows-based interface for migration scheduling, reporting and analyzing utilities and database management for all hierarchy levels.

Mike Marbury, an analyst at Meta Group, Inc. in Reston, Va., said that because HSM for PC LANs is still catching on, these products are not going to sell much in the next nine to 12 months. "The key issue is to educate users about this type of solution," he said.

Hierarchical Storage Manager 1.0 costs $6,995 for the base package. Cheyenne plans to offer an updated version of Arcserve to provide optimal integration of the two products.

Wabi appeal

CONTINUED FROM PAGE 49

you can hit about 90% of the volume."

However, some industry analysts said even with Wabi 2.0, the Wabi technology will still be too limited for widespread use. "Running the 20 leading applications certainly doesn't cover all the possible needs," said Terry Bennett, director of technical systems research at Computer Intelligence/InfoCorp in Beaverton, Ore. There are thousands of Windows applications, he said, and users can run any of them on Windows PCs. Other users have Insignia Solutions, Inc.'s SoftWindows, an emulation program built on Microsoft code that supports all Windows applications, according to Bennett.

Wabi, originally an acronym for Windows Application Binary Interface, was announced in May 1993 and shipped in September 1993. A translation technology, Wabi lets Windows application code run on top of Unix operating systems and the X 11 R5 windowing standard from the X Consortium in Cambridge, Mass.

Users said Wabi works well enough to run applications such as Microsoft's Excel, PowerPoint or Project on Unix workstations. It saves them from having to walk to another office to run Windows applications on a PC and lets them share data with other departments standardized on PCs and Windows software.

Some users have even used shared copies of Wabi, running on a Unix server, to reduce the disk space needed to store Wabi on each client workstation. Bill Patterson, a systems manager at the University of Wisconsin business school in Madison, Wis., said several X terminal users at his site share a copy of Wabi running on a Sun SPARCstation 10, along with a multiuser version of Excel.

"It's just like sharing other packages. It's just an executable [code] that you can run [in] multiple copies," he said. Some of the graduate students have been managing their financial portfolios using Windows-based Excel but now have the option of using Applix, Inc.'s Unix spreadsheet, which was added to the Sun server this summer, Patterson said.

User complaints

Users acknowledged that Wabi has not been free of problems, but some stopped short of detailing those problems on the record. Others said they were frustrated enough, however, to limit their use of Wabi or avoid it altogether. One oil firm tried Wabi, then decided to spend the extra money to have engineers use Unix workstations and separate Windows PCs.

At AT&T Network Systems in Columbus, Ohio, users found that Wabi 1.1 allowed them to use company standard Windows applications such as Microsoft's Project on Sun workstations, according to Scott Elliott, a member of the technical staff. "A lot of times people in other departments who have PCs give us graphics to include in our presentations, and we give them graphics to include in theirs," Elliott said.

He also said he tried a Windows-based drawing application from Micrografx, Inc. in Richardson, Texas, that has not been certified for Wabi, and it worked.

Halford said that is not unusual — about 50 Windows applications not officially certified for Wabi can be used without difficulty. However, industry analysts warned that undocumented Windows system calls can halt or slow performance on such uncertified applications.

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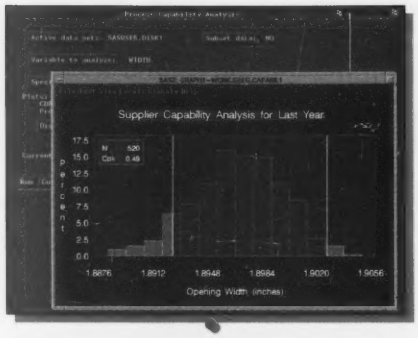
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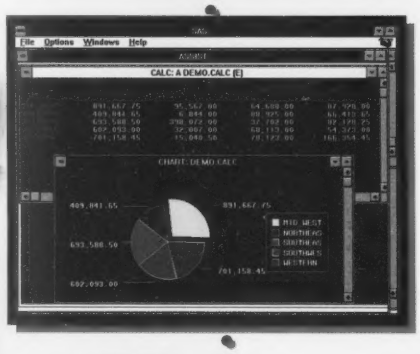
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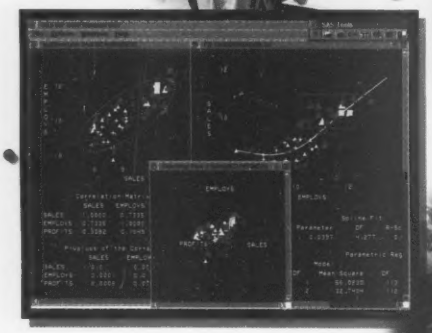




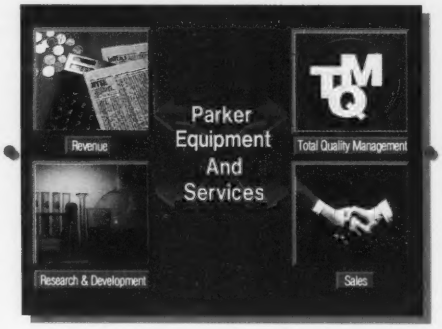


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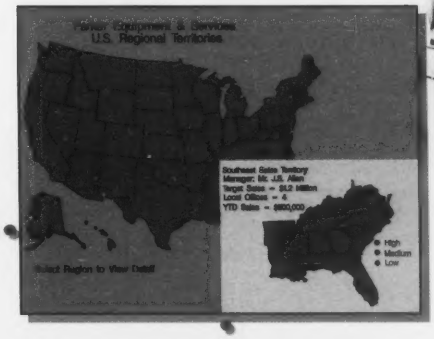
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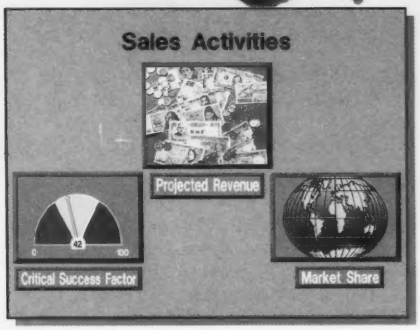
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Axil Computer, Inc. has announced the Axil 320 and Axil 245 workstations and the AxilServer S/311 departmental server.

According to the Santa Clara, Calif., company, the Axil 320 is a Sun Microsystems, Inc. SPARCstation 20-compatible workstation, and the Axil 245 is a SPARCstation 5-compatible workstation with an 85-MHz CPU. Both feature multiprocessing architectures.

The AxilServer S/311 is a deskside server with a modular architecture that lets users upgrade from the Axil 311 workstation by adding stackable media and disk drive boxes for up to 24G bytes of storage.

The server's multiprocessing architecture allows up to four CPUs. All three products offer both HyperSPARC or SuperSPARC microprocessors.

The Axil 320 costs $15,300, the Axil 245 costs $11,380, and the AxilServer S/311 costs $20,000.

▶ *Axil Computer*
(408) 486-5700

Rupp Technology Corp. has announced WinLynx, PC-to-PC file transfer software.

According to the Phoenix company, WinLynx lets users move and manage files between connected PCs while remaining in Windows.

Features include drive and directory synchronization options, resource sharing and background file transfers.

The product provides cross-directory tagging, retagging, reverse tagging and searching by selected attributes.

WinLynx costs $169.

▶ *Rupp Technology*
(602) 224-9922

Creative Interaction Technologies, Inc. has announced AshWin, a Windows-based job scheduler.

According to the Chapel Hill, N.C., company, AshWin provides mainframe functions such as automated batch, repetitive, dependent and background processing to client/server networks.

AshWin maximizes idle microprocessing power across a Windows TCP/IP or Novell, Inc. NetWare network so administrators can schedule, control and monitor automated batch processing. No manual intervention is required for tasks to be processed once a schedule has been created.

Prices start at $1,495.

▶ *Creative Interaction Technologies*
(919) 489-6300

LAN-Aces, Inc. has introduced OfficeLogic for Windows, a groupware product.

According to the Houston firm, OfficeLogic for Windows runs on all network operating systems, uses existing hardware and provides users with instant access to integrated electronic mail, group and personal scheduling, phone messaging and databases.

The product includes wide-area network support for remote groups, on-line conferencing and faxing through most fax gateways.

Prices range from $495 to $4,995, depending on the number of users.

▶ *LAN-Aces*
(713) 890-9787

Product short

Spectrum Computer Technologies Corp. has announced Complaints Desk for Windows, customer relations software. The product lets users record, organize and monitor customer complaints, requests and suggestions. Features include graphing, querying and word processing. Cost: $179. Spectrum Computer Technologies, Niagara Falls, N.Y. (716) 283-0825.



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WELLFLEET

Price is right for ATM suite

Users reluctant to commit without standards

By Stephen P. Klett Jr.

First Virtual Corp. last week rolled out an Asynchronous Transfer Mode (ATM) product suite aimed at driving multimedia applications to the desktop at prices ranging from $500 to $800 per seat. Observers were impressed with the company's strategy and products but said it faces a major hurdle in persuading business users to commit to the products in a pre-standards environment.

Start-up First Virtual in Santa Clara, Calif., was formed by Ungermann-Bass, Inc. founder Ralph Ungermann, who serves as chief executive officer. To hit its aggressive price levels, the firm is building its desktop ATM strategy on 25M bit/sec. technology and proprietary software called the Multimedia Operating System (MOS), which acts as an interface between ATM and legacy LAN applications [CW, Sept. 12].

"First Virtual is coming up with a solution where other vendors are offering technology," said Jennifer Pigg, director of data communications at The Yankee Group in Boston. However, to provide users with an end-to-end desktop ATM network, First Virtual is taking a risk because it is moving ahead of standards, Pigg said.

"Ralph Ungermann must do a good job of giving users quantifiable assurance that future software updates won't bring users' applications to a screeching halt," she said. However, even with this assurance it will be difficult for First Virtual to get users to run their mission-critical applications on the technology, she added.

On the rise

Only 5 million Windows-based multimedia PCs shipped last year, according to Dataquest, Inc. But, the market researcher says that number will hit 23 million by the end of 1995. Research firm Hambrecht & Quist, Inc. said the interactive video applications market will be worth $2 billion to $4 billion by 1997.

Users are cautious

"I think that business is probably not the right market for a start-up to target because business users will need something standard to ensure interoperability and support," said David Pinkard, technical consultant at Mallinkrodt Medical, Inc. in St. Louis. "Although we want to move ahead quickly with multimedia, I'm not sure I'd look seriously at this because I need to know, will it work with what I've got and will it coexist" with network operating system applications.

Pinkard said he also needed to know how it would be managed — whether he could manage it through Hewlett-Packard Co.'s OpenView, for instance.

First Virtual is taking steps to address these questions. For example, its list of third-party support includes Novell, Inc. and Lotus Development Corp. Microsoft Corp. support is forthcoming. And the MOS, adapters and hubs include Simple Network Management Protocol agents to allow them to be integrated into management platforms such as OpenView, the company said.

Some observers said these steps — combined with the low prices — will eventually win over cautious users.

"I feel the questions are minor issues in the bigger light of someone taking ATM in a new direction," said Valentin Sribar, a program director at Meta Group, Inc. in Reston, Va. "Plus, it'll cost only about $10,000 for users to get it up and running, which isn't a big risk. They can bring it in and play with it for a while at that price."

Ready to roll

By Jan. 1, First Virtual will deliver the following products:

▶ **MOS:** Operating system software that sets up separate ATM paths to carry voice, data and video traffic. Supports Microsoft's Object Linking and Embedding, which will allow users to pull video and voice clips into word processing and spreadsheet applications. Prices start at $2,000 for a 10-user license.

▶ **Media Server:** A redundant arrays of inexpensive disks server from partner Conner Peripherals, Inc. with built-in MOS that provides real-time storage and retrieval of video, audio and image data over ATM. Initially, the server will be available in 4G- and 8G-byte versions for $15,000 and $20,0000, respectively.

▶ **Media Switch:** Provides eight to 24 full-duplex 25M bit/sec. desktop connections over Category 3 unshielded twisted-pair copper wiring. For higher-speed connectivity for devices such as servers, 51M, 100M and 155M bit/sec. interfaces will be available. Prices start at $3,400.

▶ **Media Adapter:** Software-based network interface cards that support ATM and provide transparent access to legacy LAN traffic. The cards support ATM Forum Class of Service and Quality of Service definitions. Prices start at $330.

ISDN answers talent agency's bandwidth casting call

By Ellis Booker

Listed among the William Morris Agency's 3,000-plus clients are some of the world's hottest new celebrities and entertainers.

But network manager Mike Clark is a fan of a relatively old performer: Integrated Services Digital Network (ISDN).

"We didn't have a viable backup for our TCP/IP network without putting in another dedicated line, and we weren't really sure how much bandwidth we'd need long-term," Clark said.

The new network also helps with backup tasks and will support a new database being rolled out at the company.

In January, the Beverly Hills, Calif., agency added ISDN lines to replace modem connections between its headquarters and offices in London. It also added ISDN connections to back up fractional T1 connections between Beverly Hills and New York (112K bit/sec.) and Beverly Hills and Nashville (56K bit/sec.).

The international ISDN Basic Rate Interface lines are supplied by AT&T Corp., which also handles the fractional T1 lines.

Routers from Network Express, Inc. in Ann Arbor, Mich., handle both the ISDN connections and the fractional T1 lines and can automatically shift traffic to the ISDN if the leased line connections fail.

"The last time our leased line failed it took us a while to realize it because the ISDN line simply picked up the slack and provided uninterrupted communications," Clark said.

The ISDN lines and fractional T1s were also needed for dial-up bandwidth to support a new, database application now being deployed to the company's 500-person staff worldwide.

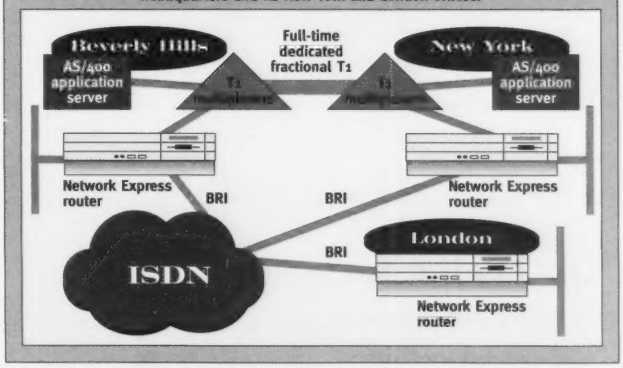
The homegrown database application, now being used in the Beverly Hills office and rolling out to the rest of the company this month, includes extensive contact lists, as well as phone log and project management modules.

"The database application is on a server here in Beverly Hills," Clark said. "The people in New York City will access it over a T1.... But if that T1 goes down, they're out of business."

Built in NextStep, the object-oriented programming language, the database application runs on a Data General Corp. platform under a relational database from Sybase, Inc. Clark says he would like to move William Morris' 2-year-old image database application to this server, which would again increase the firm's network bandwidth needs.

William Morris' wide-area network

The William Morris Agency is using ISDN Basic Rate Interface (BRI) lines for redundancy and to handle overflow from its dedicated T1 network. ISDN is the primary network between its Beverly Hills, Calif., headquarters and its New York and London offices.



Dial-up bandwidth — first using fractional T1 and eventually Asynchronous Transfer Mode — will support traffic into a centralized, object-oriented database now being deployed by the 96-year-old William Morris talent agency.

Lower-cost backup server seeks niche

By Suruchi Mohan

Vinca Corp. has announced a fault-tolerant network server for companies that can afford a few minutes of network downtime.

Remote StandbyServer is meant to be installed at a branch office that could be hundreds of miles away from the primary server. It connects into the primary server through T1/E1 links leased from a public carrier. Essentially, Remote StandbyServer's disk mirrors the hard drive of the main server.

Users said they think the product has great potential for easing network administrators' woes in the event of a disaster. Jeffrey Syring, a network engineer at Wausau Hospital in Wausau, Wis., said he plans to install Remote StandbyServer when it becomes available in the fourth quarter. He said it would be good to have a "hot backup off site. If a disaster happens at one site, we could get to the backup server."

Although functionality comparisons to Novell, Inc.'s System Fault Tolerance (SFT) III are inevitable, Jay Carlson, president of Salt Lake City-based Vinca, said Remote StandbyServer will appeal to a different audience. "We are aiming at a market that can tolerate a minute or two of delay. SFT III is for nonstop computing," he said.

With Novell's SFT III, the backup server takes over automatically, preventing lost connections. This is not the case with Remote StandbyServer. Vinca users lose the connection when the main server goes down.

Syring said, however, that Remote StandbyServer's cost advantage will steer him toward that route. He can easily upgrade to Novell's product later if he needs to, he added.

Remote StandbyServer uses wide-area network interface cards from Newport Systems, which was recently acquired by Cisco Systems, Inc. The Vinca software is located on these cards.

Briefs

DEC shakes with Proteon

Digital Equipment Corp. has inked a licensing agreement to integrate key components of **Proteon, Inc.**'s internetworking software into its hubs, routers and switches. The software includes Token Ring and SNA integration technology.

CompuServe ISDN

CompuServe, Inc.'s 14.4K bit/sec. modem support is going to get even faster. The Columbus, Ohio, company's Network Services Division has announced it will begin testing 1-800 Integrated Services Digital Network (ISDN) access. Pricing for ISDN connections has not been set. Separately, the CompuServe unit announced last week it had joined the NetView Association and hopes to migrate all its network offerings to the NetView/6000 management platform, beginning with its global frame-relay service, Frame-Net.

Networking in China

General DataComm, Inc. in Middlebury, Conn., announced a joint venture to provide the first Asynchronous Transfer Mode network in China.



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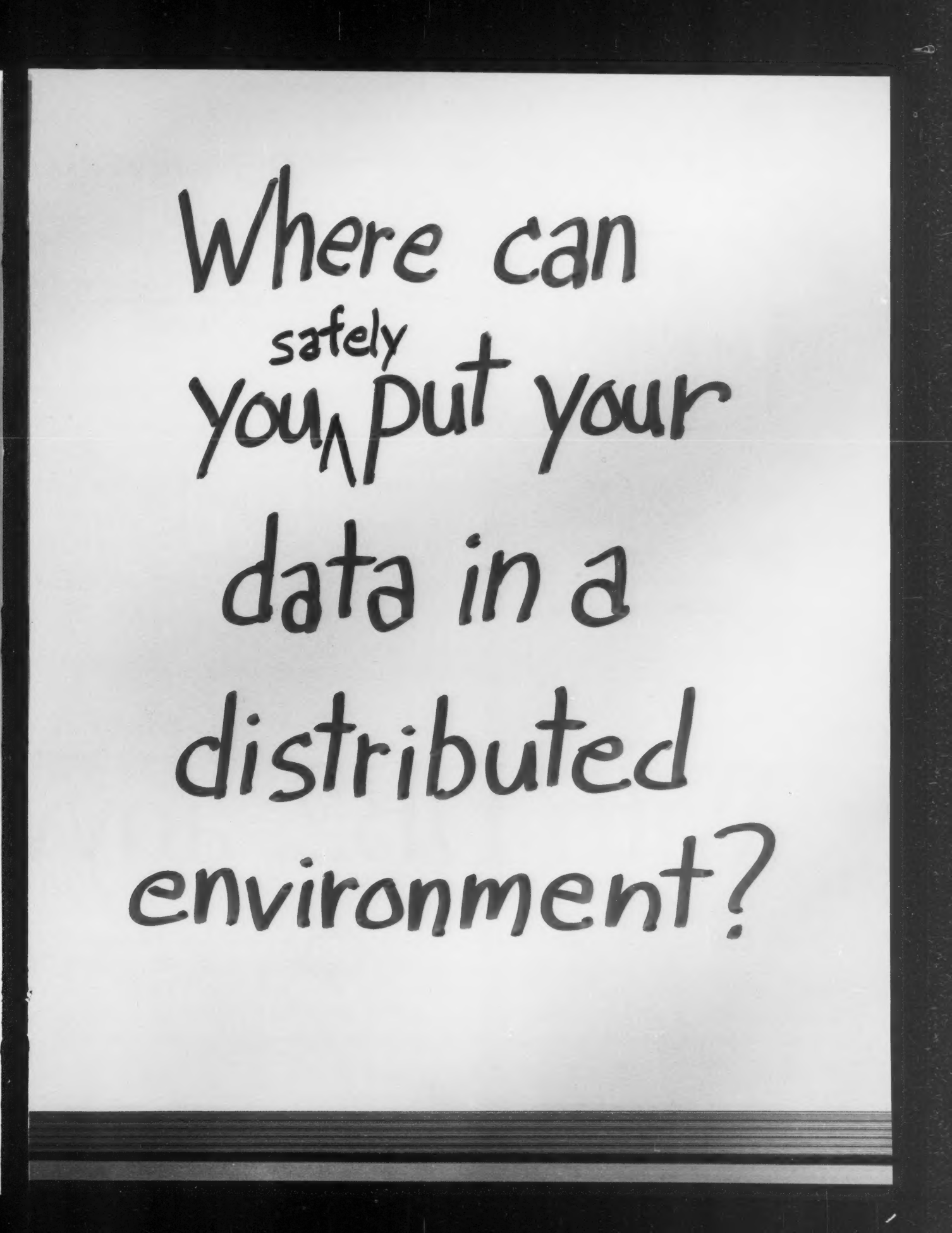
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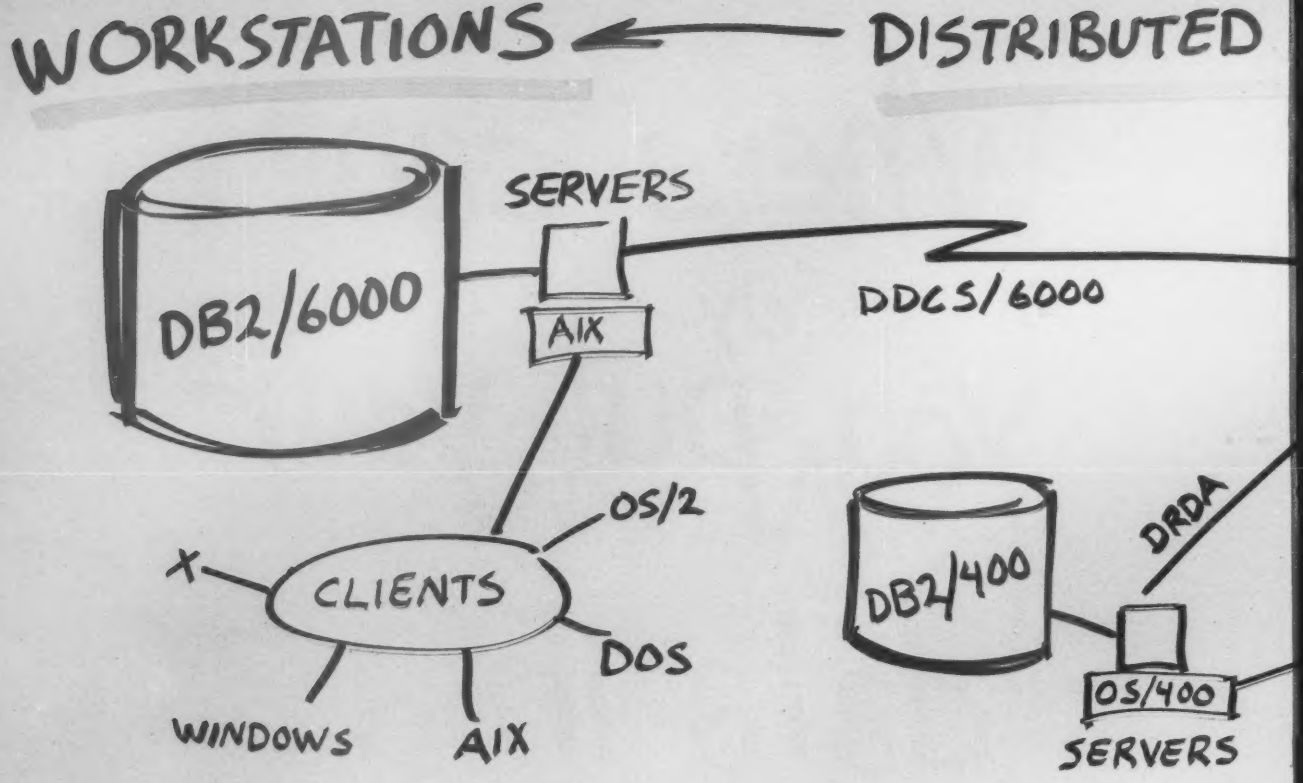
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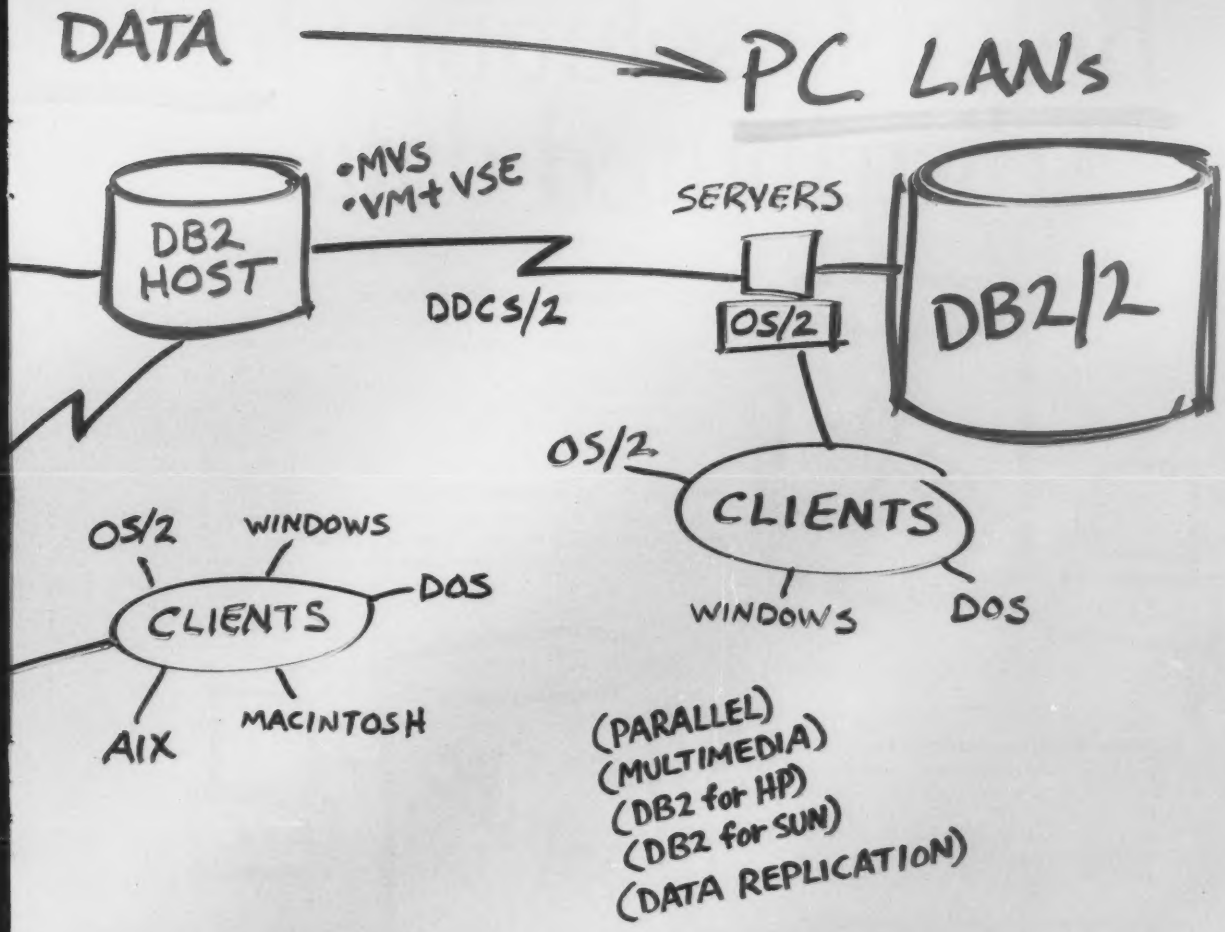


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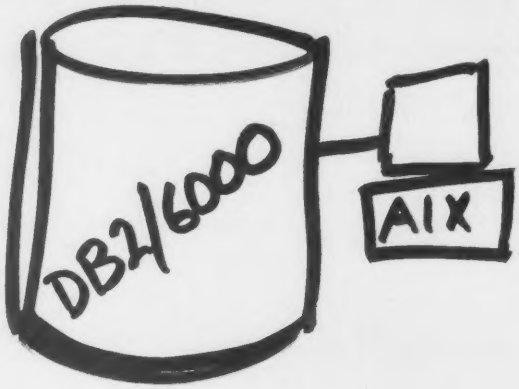
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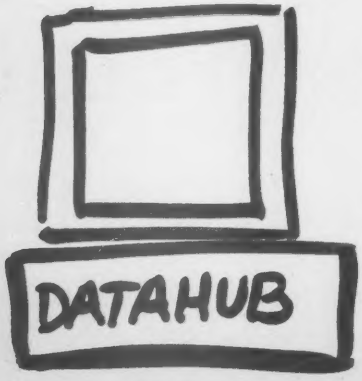


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IBM shows signs of moving toward ATM

By Suruchi Mohan

■ IBM continues its march toward Asynchronous Transfer Mode (ATM) with a slew of new and enhanced products introduced recently. Key to its effort, analysts said, is a multiprotocol router family that will natively support SNA and some LAN traffic across most routers and controllers.

Another key announcement is the ability to route network traffic over Token Ring, Ethernet and frame-relay links. Analysts agreed that while IBM cannot hope to become the market leader in multiprotocol routing, its offerings will make sense to SNA users who want to integrate LAN traffic onto their existing networks.

Analysts also said the new IBM products clearly signal a strategy shift toward ATM and TCP/IP networks.

Tom Nolle, president of CIMI Corp. in Voorhees, N.J., said this announcement marks the first time IBM has offered TCP/IP in native mode.

Another signal that IBM is moving toward ATM is that the company has grouped its routers, switches and adapter cards under the Nways multiprotocol router family, according to Glenn Gabriel Ben-Yosef, senior analyst at The Yankee Group in Boston. The idea is to foster more communication among the diverse groups within IBM and get them rolling toward a common goal, he said.

IBM's low-end 2210 Nways multiprotocol router features software from Proteon, Inc. The 2210 supports both SNA and TCP/IP in small, branch-office type establishments. It offers minimal connectivity but has a low entry point — connectivity for one Ethernet LAN and two WAN links costs about $2,000, said John Steigerwald, manager of router development at IBM in Raleigh, N.C.

In control

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Twice as nice

IBM also offers two Nways Multiprotocol Routing Network Services software programs, with or without Integrated Services Digital Network support. Both programs can handle TCP/IP, Data Link Switching, frame relay, X.25 and Point-to-Point Protocol.

Robin Layland, principal consultant at Layland Consulting in West Hartford, Conn., said although the 2210 is good, IBM faces stiff competition from other vendors. Additionally, users will need a router at the main site that interoperates with the branch-office router.

Also, at the end of the year, IBM will start shipping the stand-alone version of its 3746 controller. Instead of being merely a set of fast adapters for the 3745, it will offer support for TCP/IP routing, including Open Shortest Path First and High Performance Routing, an enhanced version of Advanced Peer-to-Peer Networking. IBM will also offer an ATM attachment to the 3746 at the end of 1995.

IBM's new multiprotocol strategy may stand the company in good stead, said Reinhard Rackow, manager of network computing services at Information Systems Management Corp., an outsourcing company in Regina, Saskatchewan.

Rackow's clients are loyal to IBM products. "So far the 6611 didn't meet the need. They are looking at how to tie SNA to non-SNA traffic," he said.

IBM, Security Dynamics join forces

IBM recently announced it is teaming with Security Dynamics, Inc. in Cambridge, Mass., to combine the "single sign-on" security in its Network Security Program (NetSP) with the strong authentication in Security Dynamic's SecurID technology.

The marriage, in the form of interoperable software expected in the first half of next year, will be especially attractive to organizations with heterogeneous, distributed environments, the companies said.

Using encryption and a special "authentication server," IBM's NetSP lets users access any enterprise server by entering just one user identification and password. It enhances security by minimizing the temptation of users with multiple passwords to write them down where others may find them, the companies said.

SecurID uses a credit card-size device that computes and displays a new password each minute. A corresponding feature on a host or network server ensures that the user card and host machine always agree on what password is valid at any moment for any user. SecurID also employs a secret personal ID number entered by the user with the password.

"I like what I'm hearing, but I'll have to see how it's configured before I can say this is a wonderful marriage," said Dwayne Johnson, vice president for information security service at First Bank System, a bank holding company in Minneapolis.

Johnson, who uses SecurID but not NetSP, said the single sign-on concept is what most users are moving toward. "But it also creates problems for the security administrator," he said. "You have one ID and one password that can suddenly unlock the world."

— Gary H. Anthes

E. Ted Prince

The latest threat to IS



IS has survived many assaults on its existence. User-driven systems, PCs, outsourcing, visual programming. The latest is now upon us from an unlikely source: on-line systems. Will IS survive this one?

Do you remember when communications was the ugly stepchild of the IS world? In those days, application developers were the social equivalent of nuclear physicists. The communications guys (there were no women in these areas) were the pariahs who did necessary but unfathomable things with hexes and patchboards. This was not an area for ambitious information technology types. The only great thing about it was that everyone left you alone because management and even the information technology directors didn't have a clue what you were doing.

That's a far cry from IS today. Its fastest growing areas are networking and communications within and outside the corporation. Now the networking types have become top dogs. After all, anyone can build an application, can't they?

In the beginning, users needed IS for networking. Setting up networks, addresses, new nodes and security were intractable problems that sent corporate power back to IS. But the users have been fighting back.

At your service

Ever tried the on-line services? They do this all for you. You can set up your own networks just by buying a modem, getting their software and paying around $10 a month. From there on they handle all your networking. Adding new users to your network is as simple as getting them to pay their $10, too.

For this fee you get unlimited E-mail to anywhere in the world as well as people in your own corporation. Communications with suppliers and customers is just as simple if they subscribe to the same service. Transferring files, documents and graphics is also part of the service. Plus you get access to incredibly powerful databases of information for corporate, research, technical and commercial purposes.

So who needs a LAN, WAN or ultimately IS? With these new services you can roll your own. But isn't there going to be a problem shifting around big files, multimedia and video without a LAN in place?

Remember cable? Within a year or so you're going to connect to your on-line service via cable rather than POTS (plain old telephone service), and you're going to have all the bandwidth you could ever need. The Baby Bells are now rushing in to provide frame relay for small companies and are finally moving ISDN into the real world. So bandwidth is not going to be a problem for the user in the future.

Doesn't this sound suspiciously like the old service bureaus of yesteryear, the ones we used at the dawn of computing when it was too expensive to buy computers ourselves? Precisely. Except that this time they're providing something, in this case networks, that are also expensive and complex to set up on your own. The more things change....

On-line services are developing into giant service bureaus, taking over not only LANs and WANs but also other IS functions, such as software downloading and uploading and providing groupware and general research and information services. These services are becoming mega-IS departments, capable of providing needs that were formerly provided by IS. On-line services are becoming the ultimate outsourcers.

So the information superhighway is becoming a lot more than a transport mechanism. In fact, it's becoming a full-service corporate support center. You supply the business, they provide IS, marketing and the like. LAN, MAN, WAN? Who cares? It's all part of the service. Leave it to the techies and get on with the business.

Will IS survive this one? I have no doubt it will, but its role will change again until the next new technology comes along that needs highly specialized knowledge (try virtual reality, in about two years time).

Prince is president of Perth Ventures, Inc., a technology dealmaking, publishing and consulting firm in Hawley, Pa. He can be reached by CompuServe at 74073,1236.



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Data access tools

SAS library eases path to mainframe data

By Rosemary Cafasso

SAS Institute, Inc. recently completed its trio of data access services intended to help users make better use of mainframe data.

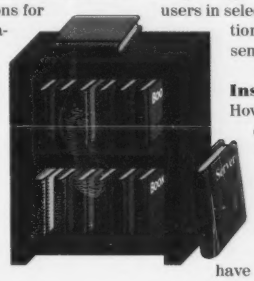
The final piece, Remote Library Services, gives SAS PC users direct query access to SAS mainframe data. The software was targeted for a June release but was delayed two months for fine-tuning, the company said last week.

It joins Remote Computing Services, which allows users to designate a job for processing on a remote server, and Data Transfer Services, a more basic tool that downloads SAS mainframe data to PCs.

Options for users

SAS is a veteran mainframe software company that sells a core data management product — the SAS System — that works with more than a dozen SAS analysis, query and presentation tools. In recent years, the company has branched out into the client/server world and released an executive information system as well as data analysis and management tools for Unix and Microsoft Corp.'s Windows NT servers and Windows and IBM OS/2 workstations.

The idea behind the SAS data access tools is to open up options for getting at mainframe data. The options provide more front-end functionality than terminal access or terminal emulation and are more efficient than enormous downloads of data to PCs.



Several users contacted last week said they are either deploying these tools or intend to do so because of the flexibility they expect them to provide.

"We could have given users [direct] access to the mainframe, but we aren't encouraging that because we are moving to client/server," said Harmon Jolley, a project manager in the information systems and services division at Provident Life and Accident Insurance Co.

Instead, Jolley is deploying all three SAS data access options to improve the SAS environment's overall performance. He is putting in place policies to guide users in selecting the data access option that makes the most sense for the job at hand.

Installation help

Howard Dresner, a research director at Gartner Group, Inc. in Stamford, Conn., said the data access services will help users with large mainframe installations.

"Otherwise, they'd have to physically move the files down to the PC, which involves a huge amount of networking bandwidth," Dresner said.

Remote Library Services, Dresner added, is essentially a remote presentation function that provides "the user interface on the PC and some rudiments of functionality, but the mainstay lives on the host."

For example, Remote Library Services is best for lower-volume data requests or ad hoc queries that cause minimum data transfer across the network.

Queries involving huge data sets and lots of number crunching are best left to Remote Computing Services so the job can be done at a remote site instead of a PC.

Bill Hutchison, a senior programmer analyst at Intel Corp., is another user setting up guidelines to help others take advantage of the SAS options. In Hutchison's case, he is actually creating canned queries that use Remote Library Services.

"It gives us another option so we don't have to download tables," Hutchison said.

The Data Transfer Services is useful if a customer needs to work with mainframe data at a local PC for an extended period of time.

All three services can be used with the SAS PC analysis tools and will be offered as built-in components of either SAS Connect or SAS Share, two connectivity products, at no extra cost.

IBM reworks parallel mainframe strategy

Will phase out System/390 PQS as new DB2 release ships

By Craig Stedman

While IBM's CMOS-based parallel mainframes just left the barn in April, one of those machines is already being put out to pasture.

IBM executives confirmed recently that the System/390 Parallel Query Server (PQS), a specialized engine for querying DB2 databases, will start fading from the scene after next week's introduction of Version 4 of DB2 for MVS/ESA.

The new DB2, which is scheduled to ship next spring [CW, Sept. 12], should enable most query functions to be done on the more general-purpose Parallel Transaction Server (PTS). As a result, the slow-selling PQS will be "converged" into the transaction machine, said William Reedy, director of mainframe product marketing and merchandising at IBM.

"Over time, the distinction [between the two systems] will become blurred," Reedy said. IBM will not pull PQS from the market, nor will it abandon the small number of customers who have installed the query machine. But it will try to "push them down this path" toward the PTS, he added.

The transition path will not be a well-traveled one, according to analysts. Charlie Burns, research director for large computer strategies at Gartner Group, Inc. in Stamford, Conn., said IBM has shipped well under 25 PQS systems to date because of a variety of drawbacks (see chart).

No thrills here

Several mainframe users said last week that they were underwhelmed by their first look at PQS, largely because of the need to stop all querying while the databases on the machine are updated from a host ES/9000 system.

General Accident Insurance of America is in the early stages of planning a data warehousing project, but PQS "didn't thrill me a whole lot," said John Elcock, assistant vice president of computer resource management at the Philadelphia-based company.

"It was kind of surprising that IBM would come up with a system that had to be attached to another computer," Elcock said. "I thought they might have come up with a more elegant system." The specialized nature of PQS also worked against it, he added.

"This machine could only be used for one thing, and if that one thing doesn't work, you just have to get rid of the system," Elcock pointed out. By contrast, a multipurpose PTS offering "would certainly be more appealing," he said.

Doug Underhill, a technical specialist at CSX Technology, Inc., the information systems subsidiary of CSX Corp. in Jacksonville, Fla., agreed that PQS is limited to "some subsets of functionality" that are too narrow to justify the "not very attractive price" IBM has been charging. "The economics did not make for a real good business case," Underhill said.

Planned enhancements

In April, IBM said it planned to develop a stand-alone version of the 48-processor PQS that could attach directly to SNA and TCP/IP networks [CW, April 11]. But that is no longer in the blueprint, Reedy said. He acknowledged that the number of PQS systems shipped to date "is not a ton of systems."

IBM does plan to add database updating capabilities to PQS, and full convergence with the PTS system could take a couple years to complete, depending on DB2 development schedules, according to Reedy. But Burns and other analysts said they

PQS, *page 70*

Query quashers

Shortcomings that limited demand for IBM's PQS include the following:

- **Based on MVS and DB2.** Most new decision-support applications are being put on Unix systems, according to analysts.
- **High cost.** PQS selling prices are typically more than $1 million, IBM acknowledged.
- **Not a stand-alone system.** The first PQS implementation requires an Escon-capable ES/9000 mainframe as a host.
- **No data update capabilities.** Data must be updated by the host mainframe, forcing all queries to be stopped.

DATA WAREHOUSE

Amdahl system rates higher

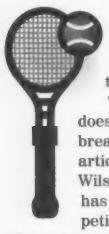
Amdahl Corp. also introduced a parallel query system earlier this year based on NCube's hardware and Oracle Corp.'s database. That machine "has less of a strike against it" than IBM's PQS because of its Unix/Oracle nature, "but it still more or less addresses the same small market," said analyst Bob Djurdjevic, president of Annex Research in Phoenix.

Sports Illustrated powers up Mac

By Mark Halper

Editors and writers at *Sports Illustrated* will soon be spinning their yarns about Andre Agassi, Joe Montana and other sports figures on Power Macintosh computers. That's because of an information systems decision to leave behind a corporate Digital Equipment Corp.-based publishing system in favor of departmental technology.

Harry Wilson, the magazine's network administrator, said he is bidding adieu to Atex Publishing Systems text editing software running on a Digital PDP 11 because in a magazine world increasingly driven by graphics, design and layout, the Digital/Atex system is simply too limited.



"It demonstrates line endings, but it doesn't show you the actual final line break, and it won't show you what the article actually looks like on a page," Wilson said. That lack of refinement has become unacceptable in a competitive production environment where typography plays an integral role, he noted.



Sports Illustrated hopes to have a Power Macintosh network in place for its 100 writers and editors within two months and to bring it live on a section-by-section basis in the spring.

Keeping up with the Times

The magazine is following the lead of *Time*, *Money* and other Time, Inc. publications that have already switched from the central Digital/Atex system to decentralized Macintosh networks. Eventually, all of the company's magazines will be on Macintosh computers, according to Dennis Chesnel, director of editorial development at Time.

The absence of a WYSIWYG quality costs *Sports Illustrated*'s editorial staff of 100 editors and writers hours each week in aggravating rewriting and redesigning exercises, Wilson said. The magazine is choosing between two editorial programs, one from Quark, Inc. and another from Scitex America Corp.'s P. Ink, that provide editors with an accurate view of their story layouts.

"The writers will be able to work in a word processor but get feedback on how their story fits in the layout," Chesnel said. "That's an important feature for us."

Macintoshes are popular at Time because of the superiority of graphics and text programs compared with Windows, Wilson said.



But technology alone did not influence Wilson's decision at *Sports Illustrated*. Corporate IS economics, if not politics, also encouraged the move. According to Wilson, Time has mandated that all publications move off Atex by 1995.

Chesnel said that was not quite true. Rather, he noted, each time a Time publication leaves Atex, the remaining publications pick up some of the costs that that publication had been contributing to maintaining the Atex system.

The cost of maintenance did indeed play a role in *Sports Illustrated*'s decision.

The old Atex system is "costing us somewhere close to a million dollars a year to maintain," Wilson said. "We should be able to do a little bit better than that."

Training investment

One cost Wilson should not contain too severely, cautioned Bonnie Rogers, news systems manager at the *Dallas Morning News*, is the cost of training editors on the new system.

"If you skimp on that, people end up getting frustrated and not using the software the way they're supposed to," said Rogers, who oversaw the *Morning News*' move off a DEC PDP 1184 to a Tandem Computers, Inc. system from Systems Integrators, Inc. last year [CW, Feb. 1, 1993].

During its transition, the *Dallas Morning News* sent editors to five full days of training and sent reporters to two full days, she said.

That message was not lost on Wilson, who noted that *Sports Illustrated* is still working out training and support details.

"We're going to have to determine how we'll provide support to the same level that it is provided by an outside department now," Wilson said. Currently, Time provides round-the-clock support. If *Sports Illustrated* is to meet that level, it would have to consider adding people and developing flextime work schedules, he said.

Staffing changes

Chesnel noted that each Time publication is adding between one and six workers for editorial systems support, depending on the size of the publication.

Support, he acknowledged, is a questionable cost variable. "It's very difficult to say how it will all shake out because while operating costs are lower in the workstation environment, we're also adding technical staffs within each division," Chesnel said.



A central Time staff will continue to provide terminal repair functions while the individual magazine staffs handle application and workflow issues, he said.

So how are *Sports Illustrated*'s editors feeling about the upcoming switch from their dumb Atex terminals to their graphical user interface-slick Apple Computer, Inc. computers? According to Wilson, "It's been pretty much a mixed reaction; some are saying 'It's about time,' but some are pretty set in their ways."

System tryouts

Harry Wilson, *Sports Illustrated*'s network administrator, estimated it will cost "about a quarter of a million" dollars for roughly 100 end-user Power Macintosh 7100s and 8100s. File servers and a network will cost a comparable amount, and text software will cost about $200,000, he said.

Wilson said his server selection will probably be determined by the text software chosen: P. Ink runs on Unix, while Quark runs on Novell, Inc.'s NetWare or on Unix if Apple protocols are installed. He is not considering Microsoft Corp.'s Windows NT, although that operating system could become a factor over time, he said.

The network will include a Unix network management program from Cabletron Systems, Inc., Wilson said. Dennis Chesnel, director of editorial development at Time, said databases will eventually be connected across Time's magazines for archive sharing.

—Mark Halper

Help/Systems, Inc. has announced Auto Tune 5.0, automatic performance tuning software for the AS/400.

According to the Minnetonka, Minn., company, Auto Tune 5.0 adds tuning for interactive jobs and the machine pool. An interactive job is converted to a batch job only for the duration of the batch work.

Users can adjust two different sets of performance factors for day and night environments. A client Windows interface lets users display color graphs of performance history statistics.

Prices range from $2,450 to $7,800.

▶ *Help/Systems*
(612) 933-0609

Software AG of North America, Inc. has announced the Unix Productivity Pack, a Unix development environment on CD-ROM.

According to the Reston, Va., company, the Unix Productivity Pack reduces the time and effort involved in writing Unix-based applications.

The CD-ROM includes the following Software AG applications: Adabas, a relational database management system; Natural, a fourth-generation language; Entire Net-Work network middleware; Natural Construct, an application generator; and Predict, a data dictionary and operational repository.

A second CD-ROM includes complete product documentation and three manuals. An automatic installation feature is included.

Prices for the Unix Productivity Pack range from $30,000 to $120,000, depending on the number of users.

▶ *Software AG*
(703) 860-5050

UniSolutions Associates has announced Bart, a backup, restore and tape management system.

According to the Redondo Beach, Calif., company, Bart lets users schedule networkwide file system backups, track backup tapes and schedule file restores with an on-line tape database.

The product provides automated access to any proprietary backup method and has an internal scheduler to perform backups automatically after scheduling parameters are set by the user.

The contents of each backup are recorded in a tape library database and a report database of scheduled backups. Users can initiate restores by highlighting files from an on-line log, which the administrator then queues for approval.

Prices start at $1,495.

▶ *UniSolutions*
(310) 370-4024

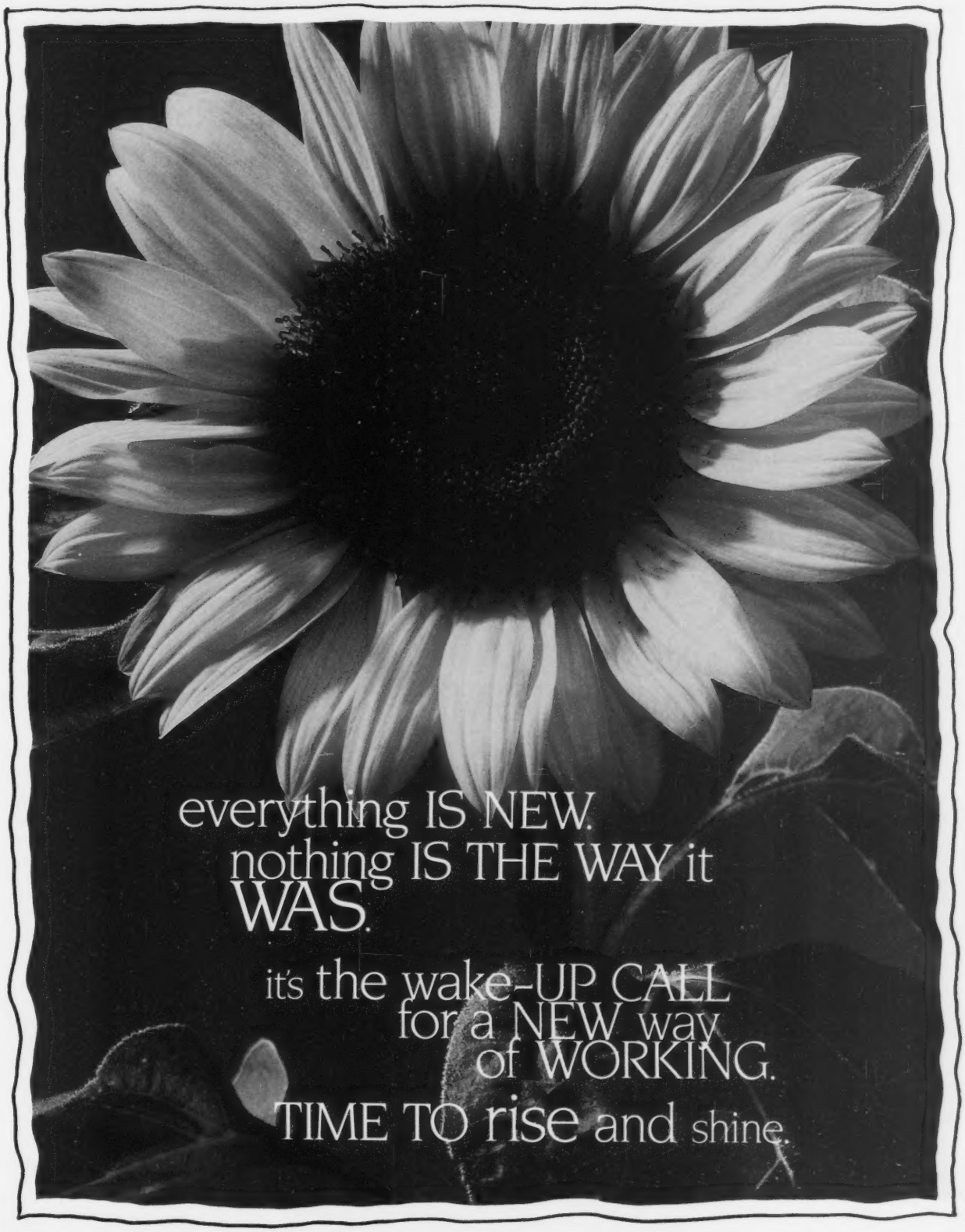
PQS

CONTINUED FROM PAGE 69

expect PQS shipments to stay at the trickle level at best.

Bob Djurdjevic, president of Annex Research in Phoenix, said the query server was originally expected to ship last year as a "stopgap measure" before PTS became available. But development was delayed and the two machines were released at the same time, making PQS "a solution looking for a problem," he said.

PQS sales forecasts were never very high because database querying remains a relatively small market dominated by the Teradata unit of AT&T Global Information Solutions, Djurdjevic added. "It's not a natural type of a market," he said. Even Teradata "is not a household name in the industry."


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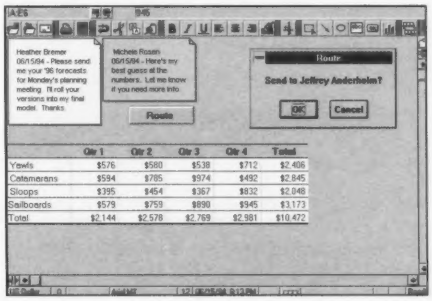
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Plus, unlike other spreadsheets, 1-2-3 can designate particular ranges for comment or review by particular users, rather than routing the entire worksheet. Range Routing lets you mail the spreadsheet range to workgroup members for input, track progress, then roll everyone's ideas back into your file, complete with comments and changes tracked as versions.

1-2-3 Release 5 worksheets and ranges can be routed using either VIM or MAPI based e-mail and can be routed either serially or in parallel.

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With Lotus Maps you can create instant maps of geographic data. Select a range of data and watch 1-2-3 Release 5 create the appropriate map with color-coding based on data ranges. 1-2-3 Release 5 ships with maps for the world by country, U.S. by state, Canada by province, Europe, Mexico, Japan, Taiwan and Australia.

1-2-3 Release 5 features seamless integration with Lotus Approach® database to easily create data entry forms and generate reports and mailing labels.

With Fast Format you can apply the formatting you've designed for one range to any other range in the worksheet — with one click of the mouse.

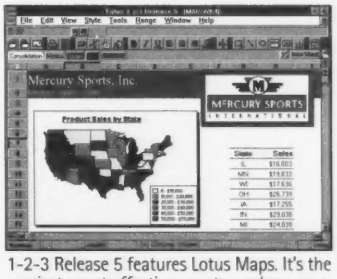
One-Step Charting lets you build a chart complete with labels, titles and legends, all in a single step.

Drag-and-Fill fills in ranges from other documents in just one step. And our improved OLE 2.0 Drag-and-Drop lets you move copy or data across worksheets or files fast.



Multi-page Print Preview lets you view up to nine spreadsheets on your screen before you print.

Taken all together, the new 1-2-3 is loaded with enhancements that make getting the job done a whole lot easier—alone or in a workgroup. And 1-2-3 Release 5 gives you the best compatibility with 1-2-3 for DOS of any spreadsheet. To learn more about 1-2-3 Release 5, visit your Lotus Authorized Reseller or call **1-800-TRADE-UP, ext. A151** *for a free demo disk. A 1-2-3 upgrade costs $119.**



1-2-3 Release 5 features Lotus Maps. It's the easiest, most effective way to analyze your spreadsheet data geographically.

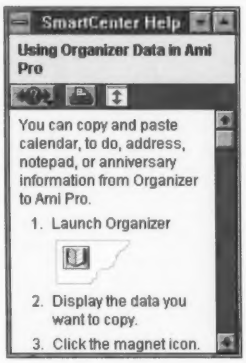
Lotus
Working Together®

NEW SMARTSUITE 3.0. A MAJOR RELEASE TO HELP YOU AND YOUR TEAM WORK TOGETHER.

To work better people need powerful desktop applications, built for both individual and team productivity. SmartSuite® 3.0 is exactly that. It's the best suite for this new way of working because it's the only suite built to optimize Lotus Notes.

The applications that make up SmartSuite have been upgraded in some very important ways—so they work harder and work together better than ever.

1-2-3 Release 5 is packed with new features like SmartMasters spreadsheets templates, Lotus Maps for geographic visuals of data, Smart Assistants to guide you, seamless integration with Approach database, Range Routing for mailing spreadsheet ranges, OLE 2.0 Drag-and-Drop, and, of course, Lotus Notes Integration.



Help Card, one of SmartSuite's powerful help tools, guides you through cross-application tasks.



The new Lotus Approach 3.0 offers unprecedented ease-of-use, PowerClick™ reporting, X10™ technology (our new, exclusive, speed-optimized architecture) and the easiest-to-design forms, mailing labels and crosstabs on the market.

Ami Pro® 3.1 offers powerfully fast word processing (49% faster than Word, 103% faster than WordPerfect®†), low memory/hard disk requirements (4MB RAM, 15MB for complete installation), with proofing tools, collapsible click-and-drag outlining, revision marking, powerful macro language and automatic list renumbering. There are over 55 predesigned style sheets for memos, faxes, reports and more. Built-in charting & in-context drawing tools. Ami Pro also seamlessly imports documents from other word processors.

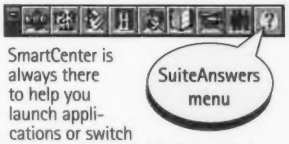
Freelance Graphics® 2.1 features task and industry specific SmartMasters, a unique 3-step process to create presentations, charting and drawing, presentation management and improved import/export capabilities.

And Organizer™ 1.1 offers easy linking for cross-referencing, flexible printing, group scheduling and nifty integration with Ami Pro so you can create monthly calendars in Ami Pro from Organizer appointments.

SMARTSUITE 3.0 IS A BETTER INTEGRATED SUITE ACROSS THE BOARD.

The integration in SmartSuite begins with a consistent look and feel across applications—they share a common user interface, menus, SmartIcons® and a Live Status Bar.

SmartCenter, the headquarters for cross-application services, is always there to help you switch or launch applications. You can customize its icon palette into the configuration that's most convenient for you.



SmartCenter is always there to help you launch applications or switch between them. And Bubble Help is right there for you–all you do is point.

SuiteAnswers are cross-application help tools which include a SmartSuite Guided Tour and task-oriented Help Cards—plus the new ScreenCam™ for creating audio/visual "screen movies." It's the only help service in Windows™ that stays up as you move between applications.

Smart Assistants are your step-by-step guide through common tasks.

And our powerful 1-2-3/Approach database integration lets you analyze and

format 1-2-3 data, taking full advantage of Approach's easy-to-use forms and reports, dynamic crosstabs to pivot rows and columns and tools for creating summaries or viewing data in several formats.

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SMARTSUITE, THE NOTESREADY SUITE, EXTENDS THE DESKTOP TO THE WORKGROUP.

SmartSuite 3.0 includes powerful workgroup enhancements. But for an even higher level of workgroup capability, just add Lotus Notes and see what happens:

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Add Notes to Ami Pro 3.1 and it becomes a real "workgroup processor." Use the built-in Notes database for efficient, secure document sharing and tracking. And you can format your Notes or cc:Mail® messages directly in Ami Pro.

Approach 3.0, the top-rated Windows database, becomes a shared reporting, forms and analysis tool. Its advanced integration with Lotus Notes lets you build sophisticated, information-intensive workgroup applications and join Notes data to other types of databases, from dBASE to SQL.

And Freelance Graphics 2.1, used with Notes, becomes a presentation storage system, a library of past presentations, which a team can browse and pull from to create new ones.

For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your Lotus A[illegible]

the COMMITTEE IS dead. long live the TEAM.

Lotus
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SMARTSUITE 3.0

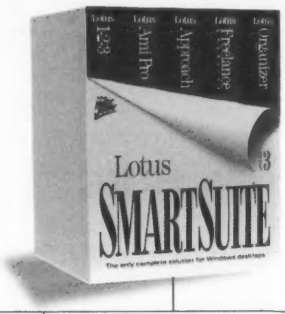
SmartCenter
(to move between applications)

SmartMasters
(for predesigned templates)

Fast Format
(apply styles throughout documents)

ScreenCam
(to put your ideas in motion)

Smart Assistants
(to guide you)



Configurable Single Install
(for easy one-step installation)

Small Footprint On Your PC
(the most efficient suite available)

1-2-3/Approach Integration
(database power in your spreadsheet)

Lotus NOTES READY

1-2-3 RELEASE 5 SPREADSHEET



SmartMasters
(useful predesigned templates)

Lotus Maps
(geographic visuals of data)

Lotus Approach Integration
(for extra database power)

Smart Assistants
(to guide you)

Range Routing
(for mailing spreadsheet ranges)

Direct Access To Database Files
(open dBASE and Paradox® files directly into 1-2-3)

OLE 2.0 Drag-And-Drop
(move or copy data, with visual mouse cues)

APPROACH 3.0 DATABASE



PowerClick Reportwriter
(for wysiwyg design)

Smart Assistants
(to guide you)

InfoBox
(instant on-screen manipulation)

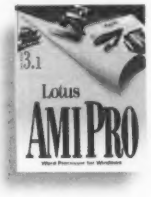
X10 Speed Architecture
(for blazing speed)

Lotus 1-2-3 Integration
(for working with 1-2-3)

PowerKey™ Technology
(for direct access to existing data)

Dynamic Crosstabs
(for drag-and-drop analysis)

AMI PRO 3.1 WORD PROCESSOR



New Proofing Tools
(for easy document proofing)

Collapsible Click-And-Drag Outlining
(simplifies organization)

Revision Marking
(edit documents without confusion)

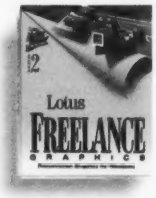
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(more professionally designed templates than ever)

Text Styling
(make your e-mail look better)

WordPerfect Switchkit®
(the move from DOS is painless)

Stick-It Notes
(add comments and messages)

FREELANCE GRAPHICS 2.1 PRESENTATION GRAPHICS



Unique Three-Step Process
(for quick and easy presentations)

One-Click Charting
(access a library of charts and drawings with one click)

Page Sorter
(presentation management at a glance— review and rearrange with ease)

Import/Export
(more file formats than ever— including Harvard/DOS and PowerPoint® 3.0)

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Easy Linking
(makes cross-referencing simple)

Flexible Printing
(for your manual planner, mailing labels from your address book)

Group Scheduling
(use with cc:Mail to set up meetings with anyone on your WAN or LAN)

Real Time Access
(instantly view co-workers' busy and free time)

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The new SmartSuite 3.0. Featuring major new releases of 1-2-3, Ami Pro, Approach database and Freelance Graphics—plus the popular and powerful personal information manager Organizer—this is the ultimate integration of your most important desktop tools. For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your Lotus Authorized Reseller or for a comprehensive multimedia overview call **1-800-TRADE-UP, ext. A152** * for the free Lotus Product Gallery CD. A SmartSuite upgrade costs $299.††

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Hospital office now 90% paperless

By Mitch Betts

Sometimes the health care industry seems like mostly a paperwork business that offers medical care on the side.

But the Washoe Medical Center in Reno, Nev., is fighting the paper tide with an information system that has cleared the aisles of file cabinets and produced a hospital business office that is now almost 90% paperless.

"Other industries may be ahead of us, but for health care that is a major change," said Jim Hauenstein, chief information officer at the 528-bed hospital.



Jim Hauenstein: *The hospital saw 'immediate benefits from the system*

"We were running out of space for filing cabinets, which were shoved into every corner possible," he noted. The benefits have shown up particularly in customer service.

Part of the solution has been the industry trend toward electronic data interchange for insurance claims. Another key element is an imaging system that scans paper so it can be easily located and used by customer service representatives to answer billing questions.

The imaging system involves a Digital Equipment Corp. 4300 minicomputer and a Cygnet Systems, Inc. optical disc jukebox. Software and systems integration were handled by Shared Medical Systems Corp. in Malvern, Pa.

Equally important is the client end of the system, where PCs run OS/2. Because of OS/2's multitasking capability, customer service representatives can see a document from the imaging system in one window and simultaneously extract data from the hospital's IBM ES/9000 mainframe.

"The benefits were immediate," Hauenstein said. "Patients' billing inquiries are now answered quickly. Callers no longer are put on hold or told they will be called back while clerks search the records stacks."

Moreover, the electronic environment provides faster turnaround of reimbursement claims, he said, thus improving the hospital's cash flow.

While the business office is nearly paperless — there will always be some paper correspondence — the clinical side of the house is just 25% paperless, Hauenstein estimated. That is largely because doctors still prefer to keep their patient notes on a paper medical chart.

But the Washoe hospital is making some progress on electronic medical records. For example, an OS/2-based application from Quantitative Medicine, Inc. in Annapolis, Md., allows 70 nurses in the intensive care unit to record and access data from a patient's bedside.

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Sybase shoots for more customized support plan

By Kim S. Nash

Sybase, Inc. wiped out its old-fashioned, one-size-fits-all support program last week in favor of a four-pronged offering intended to give SQL Server database users service options that can be better tailored to individuals' needs.

The changes, which come under the banner of SupportPlus, are innovative among relational database makers, but the rose has thorns, observers said. Some users stand to save money, but others are likely to see a 5% to 8% increase in support fees, according to Bob Johnson, an analyst at Dataquest, Inc. in Framingham, Mass.

Sybase's four new service tiers — Desktop, Standard, Advantage and Preferred — provide technical help and personalized attention not previously available, Johnson added. Still, "the challenge to Sybase will be to quantify the value received ... to justify the increased expense," he said.

Service options

More than 70% of Sybase users are likely to subscribe to Standard support, with 5% to 10% going for the top-of-the-line Preferred service, Sybase estimated.

Support makeover

Sybase and other database firms are trying to remold support programs to mirror the way customers use the products — individually, in workgroups or enterprisewide. Rival Oracle Corp. also reworked its technical support programs recently, aiming to give giant global companies such as AT&T Corp. and Timex Corp., two large Oracle customers, more unified support contracts worldwide [CW, June 6].

"We saw a demand from customers for less of a blanket approach," said Tim Artl, Sybase's director of marketing for worldwide customer service and support.

Overall, Sybase's SupportPlus is good news for small sites but could be bad news, in the form of higher fees, at larger installations.

For example, Sybase's new Desktop option targets small sites running SQL Server on Novell, Inc.'s NetWare, Microsoft Corp.'s Windows NT or other low-end operating systems. Because Desktop subscribers are likely to run small, simple applications — or even just test Sybase products — service kicks in only during local business hours, and just one person at the site is authorized to call the vendor for help.

Under the old plan, small customers had no choice but to buy the same full maintenance and $7,500-per-call phone support that the biggest Sybase users had to buy.

Meanwhile, to large SQL Server customers used to paying a relatively low price for maintenance (7.5% of their nondiscounted database license fees), SupportPlus may seem expensive. On the face of it, 7.5% looks better than new prices, which range from 16% to 30% of nondiscounted license fees, said a Sybase user at a large New York financial firm. "They would do well to show me just what improvements I can expect for my money," he warned.

Then and now

Sybase's new service options could save some users money over previous one-size-fits-all support programs

OLD PLAN	PERCENT OF DATABASE LICENSE FEE/PRICE
Database maintenance, including software updates and bug fixes	7.5%
Phone support, including emergency calls during business hours only	$7,500 per contact, up to $25,000 for four contacts in 24 hours

NEW PLAN	PERCENT OF DATABASE LICENSE FEE/PRICE
Desktop, including 7 a.m. to 5:30 p.m. support and access to CompuServe	30%*
Standard, including CD-ROM documentation and white papers	16%
Advantage, including 24-hour, seven-day service	18%
Preferred, including dedicated technician, unlimited user calls	22%

*or $4,000, whichever is higher

Dedication pays off

Indeed, Sybase's top-tier Preferred plan now offers dedicated technicians to work with a limited number of users, either on-site or from one of the vendor's 14 support offices worldwide. Other draws include free CD-ROM documentation and the ability to set up identical support structures at all sites associated with global users. Previously, service options varied from country to country.

"Sybase needed to catch up" to Oracle and Informix in the area of support, and SupportPlus "will allow Sybase to be more competitive," said Kurt Johnson, an analyst at market research firm International Data Corp. in Framingham, Mass.

Solid but flexible support can often sway database buying decisions, especially in tricky mainframe downsizing projects, users and analysts said. Transamerica Commercial Finance Corp., for example, recently chose Informix Software, Inc. over Oracle for a 32G-byte decision-support application because "I felt more comfortable that [Informix] could give us the attention we wanted," said Carole Hershman, chief information officer at the Chicago-based financial firm.

Boeing set to fly with client/server-based manufacturing

By Ellis Booker

Boeing Commercial Airline Group has announced a major commitment to client/server-based manufacturing, joining the likes of aerospace giants Hughes Aircraft Co. and Northrop Grumman Corp.

Based in Renton, Wash., the commercial airline group is The Boeing Co.'s largest operating unit, with 75,000 employees. At the end of August, it announced a $20 million software licensing deal for the Triton family of manufacturing and chain management applications from Baan USA, Inc. in Reston, Va.

Keeping it quiet

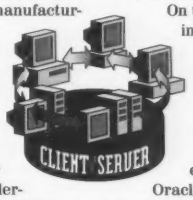
Details of the deployment are being closely guarded by Boeing, which prefers to talk about contracts in the context of the process re-engineering and systems upgrades it has undertaken over a number of years. Boeing began modernizing its equipment base several years ago, said Douglas Frederick, director of information systems support for the business process redesign effort at the company.

"We are confident that Baan's software will help give us additional capability and control that we need to build our airplanes, as well as give us the flexibility to make continuous improvements to many of our production processes," said Tom Schick, a vice president in the commercial airline group.

Industry analysts were quick to note the significance of the Boeing plan, which could scale to 15 of Boeing's 20 U.S. plants and 80 to 100 departments, they said.

Bruce Richardson, an analyst at Advanced Manufacturing Research, Inc. in Cambridge, Mass., said the Boeing/Baan deal could be the largest ever for manufacturing software.

Bruce Johnson, president of Baan USA, agreed. "We believe this could be the largest client/server production system in the world," he said, adding that he has witnessed a turnaround among commercial aerospace companies about the appropriateness of off-the-shelf software for their core systems. Specifically, they are surrendering the belief that their business is unique and thus demands custom software applications.



Richardson said commercial airline makers have been slow to move to client/server architectures. The exception was Northrop [CW, Aug. 15], which picked a system based on Oracle Corp.'s database earlier this year, primarily to carve $16 million a year from operational costs.

Calculating additional expenditures in hardware, networking and consulting related to the deployment, Richardson projected the Boeing project would come in at $50 million to $100 million.

But Boeing's Frederick disputed those figures and stuck with his original estimate. "Our estimate is $20 million," he said.

On the other hand, Boeing has publicly stated in the past that its five-year technology investment plan aims to reduce the time it takes to produce a plane by one-third to a half — from under 12 months to six to eight months — as well as reduce its overall costs more than 25%.

Baan USA won the nod after a six-month evaluation that narrowed the field to Baan, Oracle and SAP America, Inc. Oracle will provide the database for the system. The choice of Baan is significant, observers said. The privately held company, which had revenue of $105 million worldwide last year, is a distant third behind client/server manufacturing software leaders SAP and Oracle.

The first Boeing plant will be brought on-line with the Baan system in the beginning of next year.

Client/server tools hit some snags in the UK

By Clare Haney

Some customers in the UK are having problems with their development tools.

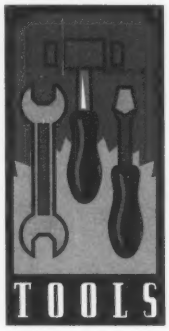
Oil giant Amerada Hess, for one, said it has had performance problems with an offshore application based on Oracle Corp.'s Cooperative Development Environment collection of client/server tools.

And earlier this year, Lars Lindstedt, senior systems designer at the European Bank for Reconstruction & Development, lashed out at Powersoft Corp.'s PowerBuilder tool for its allegedly poor scalability. Lindstedt said that while the bank remains firmly committed to the concept of client/server computing, he has doubts about the abilities of existing client/server tools.

False claims

"Many tool vendors are making significant claims about what their products can do," Lindstedt said. "My feeling is that not many people have built larger-scale systems with these Windows-based client/server tools. PowerBuilder is not the only tool there are issues with."

According to Ed Acly, director of software research at market analyst International Data Corp. in Framingham, Mass., performance problems arise because vendors are making the same cure-all claims for client/server technology that they made for computer-aided software engineering in the 1980s. And users seem ready to fall for the hype a second time around.



"Users are once again being sold on the 'silver bullet' option," Acly said. "But there is no easy way.

"Now is not the time to make quick decisions or proceed without thorough research. Too many people are making long-term decisions based on a little technology. Users need to back off and look beyond tomorrow," he said.

He welcomes the fact that users are realizing the limitations of some low-end tools. "It means problems are being addressed earlier before users have committed too much. They have the chance to do some damage control," Acly said.

Troubles abound

The European Bank had no performance difficulties with an invoice management application based on simple data structures written in PowerBuilder. Problems arose, however, when the bank spent 300 months of labor building an application for highly complex data tracking of investment projects.

Lindstedt said the application is now in production, adding, "We are still addressing some issues in terms of the extent to which it performs. It hasn't been painless, but we got there. We're now striving to make the process smoother for the future."

We want proof

Acly said he sympathizes with users. "The trouble with little client/server tools is that they are locked into a particular technology. You can't redeploy or tune them. You have to rewrite them and totally change the design."

Acly recommended that users press vendors to show them sites that have used their tools to build applications that are comparable to their own expectations.

Robin Bloor, chief executive officer of UK consultancy ButlerBloor, agreed. "You wouldn't buy a car that you later discover can only go at 50 miles an hour. If you can't go and see such a system, you know that you're playing in a different league. You're now in an area of software risk."

Haney writes for *Computing*, an IDG publication in the UK.

Liant Software Corp. has announced Open PL/I 6.0, a PL/I development tool set for Unix.

According to the Framingham, Mass., firm, Open PL/I 6.0 includes support for on-line transaction processing, VSAM, graphical user interface tools and Digital Equipment Corp. VAX/VMS extensions.

The product supports interlanguage calling, letting developers integrate tools into applications using standard calling conventions.

Open PL/I 6.0 is made up of PL/I Compiler, PL/I Macro Preprocessor and CodeWatch, a source-level debugger.

Open PL/I 6.0 costs $20,000 for an eight-user system.

▶ *Liant Software*
(508) 872-8700

XVT Software, Inc. has announced XVT Development Solution for C++ 3.0, object-oriented, cross-platform development software.

According to the Boulder, Colo., firm, XVT Development Solution for C++ 3.0 includes XVT-Architect, new features in the XVT-Power++ application framework and the integration of Rogue Waves Tools.h++ data structures.

XVT-Architect provides graphical development of portable C++ applications by providing point-and-click interaction with the XVT-Power++ object hierarchy. It comprises Blueprint, Drafting Board and Object Strata modules.

The XVT-Power++ framework has been enhanced to include portable images, portable native font access and a portable hypertext help system.

XVT Development Solution for C++ 3.0 costs $1,950 for PCs and $6,300 for workstations.

▶ *XVT Software*
(303) 443-4223

CenterLine Software, Inc. has announced ResourceCenter, a software reuse environment.

According to the Cambridge, Mass., firm, ResourceCenter lets development organizations quickly catalog, locate and retrieve reusable software assets.

The product is built on a client/server architecture and scales across an organization. It features a lexicon-based searching technology.

Users can locate and retrieve assets from within source and object code, documentation, design documents, electronic-mail messages and bug-tracking reports.

Prices start at $19,995.

▶ *CenterLine Software*
(617) 498-3000

Rational Software Corp. has announced SoDa, a software documentation tool.

According to the Santa Clara, Calif., company, SoDa generates documents using data extracted from information sources such as software engineering tools, requirements databases and code.

The product synchronizes documents with development projects and incrementally updates the portion of documents affected by changes to the system.

SoDa produces documents for every phase of the software development process and can be integrated with a variety of software engineering products.

SoDa costs $6,000.

▶ *Rational Software*
(408) 496-3600

ILOG, Inc. has announced ILOG Schedule, a scheduling application development tool.

According to the Mountain View, Calif., company, ILOG Schedule lets developers create complex scheduling applications such as manufacturing job-shop scheduling, network load balancing, maintenance scheduling and time tabling.

The product provides for the definition of single resources, volume resources such as a group of people and state resources such as configurable resources defined by a physical state.

ILOG Schedule costs $10,000 for Unix workstations and $6,500 for PCs.

▶ *ILOG*
(415) 390-9000

Product short

Blyth Software, Inc. has introduced Omnis 7(3) for the Power Macintosh, a client/server development environment. The product includes true portability and invokes the native graphical user interface of the operating environment without requiring the developer to recode for Windows or the Macintosh. Omnis 7(3) for the Power Macintosh requires Omnis 7(3) Portable Client/Server Enterprise Kit. Cost: $250 for users of the Enterprise Kit. Blyth Software, Foster City, Calif. (415) 571-1132.

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"Products were very portable and efficient. We don't believe there is anything else that will do the job." --A.C. Nielsen

"Got our users up on new system instantly. The whole migration resulted in $1M per year savings. Got applications moved in 4 months. On target and on budget." ---G.D. Searle

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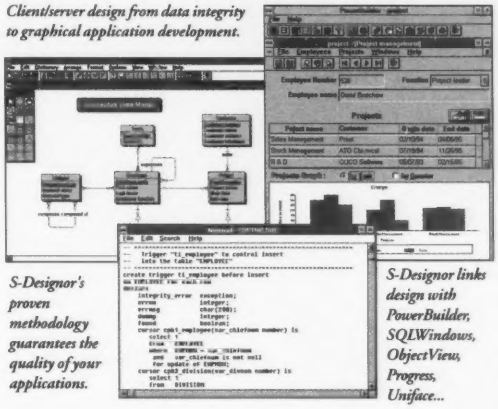


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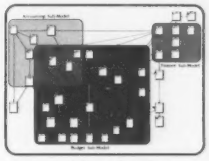
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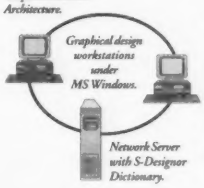
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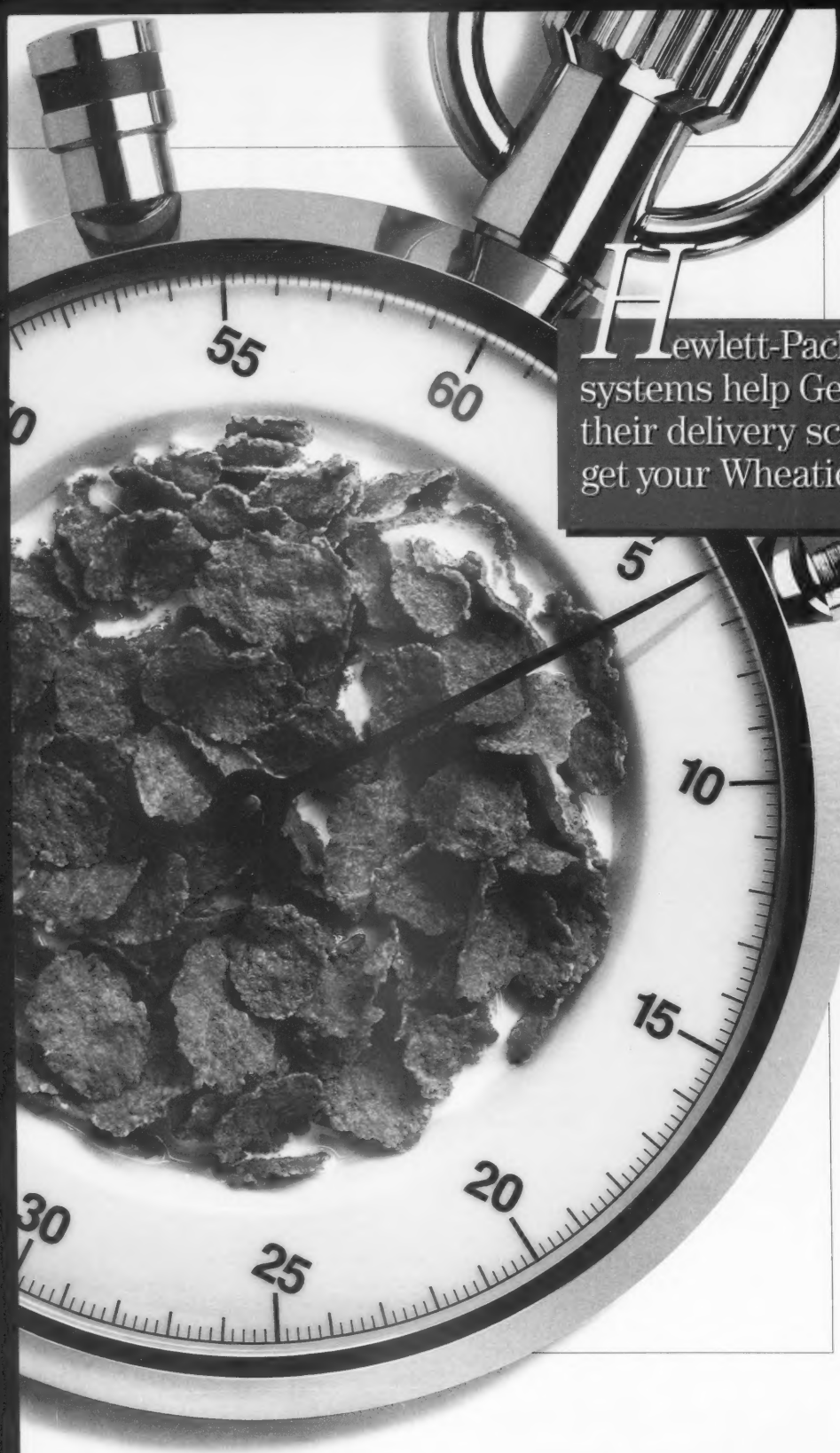


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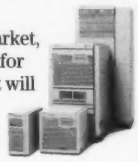
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OPINION
Look out for "leaderhype."
Page 86

BAH, HUMBUG!

When it comes to the latest IS trends, products and technologies, our readers cast a skeptical eye when separating fads from the truly fantastic



BY ROCHELLE GARNER

Sometimes it seems as if the computer industry is made up entirely of fads. Small wonder, what with pundits constantly extolling the virtues of this new technology or that new management trend. Listen long enough and it begins to sound like a troupe of carnival hucksters hawking tickets to see the Amazing Dogface Boy.

Unfortunately, it isn't about to change, what with every novelty to hit this quicksilver market practically guaranteed its 15 minutes of fame.

So how can you distinguish fads from the truly useful technologies? With a healthy dose of skepticism, that's how. The question is, which of the myriad products, technologies and trends out there warrant a jaded eye?

Computerworld wanted to find out — but not by asking all those pundits chatting up their current objects of affection. Nope, we wanted to know what *you* think deserves to be tossed into the dustbin of history. Our tool: a survey answered by 290 readers.

Your answers surprised us. Technologies we thought were near death, for example, you said will be around in five years. Conversely, you saw the tin beneath the gilded trends that many in the industry consider 14 carat.

Consider, for example, that shining principle known as re-engineering. If many readers' powers of forecasting prove accurate, it won't be around much in five years. Your reasons proved most enlightening—

HUMBUG, *page 84*

While respondents didn't express extreme skepticism for any particular management or business trend, some trends raised more eyebrows than others

HERE TODAY, GONE TOMORROW?

Management and business trends considered the least likely to still be around in five years:

Management trends

- Outsourcing mission-critical and/or competitive advantage systems
- Hiring CIOs with business, not IS backgrounds
- IS as a for-profit business unit
- The CIO title
- Account manager (IS-user intermediary) position

Business trends

- Re-engineering
- Virtual companies
- Consensus-style management
- Learning organizations
- Self-managed work teams

THE REAL THING

Management and business trends most likely to thrive or survive, according to respondents:

Management trends

- Electronic distribution of software
- Training IS personnel to be business-minded
- Building information architecture
- Seeking quantitative return-on-investment justifications for information technology investments
- Long-term (three years or more) IS strategic planning

Business trends

- Electronic commerce
- Telecommuting
- Delighting the customer as employees' top goal
- Information technology for competitive advantage
- Tying pay to individual performance

Humbug

CONTINUED FROM PAGE 83

ranging from disapproval of the methodologies now in vogue to disgust with the buzzword itself.

"I interpret re-engineering as a huge episodic effort to remake the business," says Chayim Herzig-Marx, director of Information Resources and Services at Harvard University. "I think we will reach the conclusion that [that] isn't the right way to improve."

His prescription: Fine-tune business processes through smaller, more incremental adjustments. "That way we can build in flexibility and more readily manage the changes we make," Herzig-Marx says.

Nothing new

Jim Harper, vice president of information systems at SuperGlue manufacturer Loctite Corp. in Newington, Conn., holds a more cynical and more typical view: that re-engineering is just a new word for an old process.

"Re-engineering is nothing more than analyzing a process to see how you can cut out superfluous functions. That's no different from what we did 15 years ago, only then we called it a 'systems study,'" Harper says. "The activity will always be around. We just won't be calling it re-engineering in five years."

Another trend that earned your scorn was the practice of outsourcing mission-critical or competitive advantage systems. The idea of moving something this important out of your immediate control gives many of you the willies.

Just ask Ronn Koester, director of MIS at Hickory Farms, Inc. in Maumee, Ohio. His mission-critical order-taking applications will soon leave their digs in Dallas, where they were maintained by an outsourcer, and return home to Ohio. Why? Cost and control reasons, mainly.

"Control in that if we have any problems whatsoever, we have to call Dallas and hope that they can work things out. And it's been my experience that they can't always do things in a timely manner," Koester says.

Time is of the essence

That timeliness translates into cost, especially for a catalog company that earns 85% of its revenue in the eight weeks before Christmas. In that critical period, waiting half an hour for the Dallas staff to mount a tape can cost Hickory Farms $50,000. A four-hour phone outage at the outsourcer last year rang up a $500,000 loss for Hickory Farms, not to mention the incalculable damages stemming from customer dissatisfaction.

"We can look at a package of hardware and software with a diesel generator for backup power and still spend $150,000 less a year for a more functional and more powerful system than we have with our outsourcer," Koester says.

Word of such experiences has made its way to the IS grapevine, causing IS managers to cast a jaundiced eye on outsourcing anything that is remotely critical.

Similar word of mouth has touched on the issue of hiring chief information officers with business, but no IS, backgrounds. That word is "yuck." After all, you told us one can't expect strictly business-oriented managers to make strategic technology decisions when they don't understand the technology function they head.

Earl Shaffer, a senior software engineer at the Care Management Systems of Johnson & Johnson Co. in Tampa, Fla., has watched as two such CIOs were asked to leave. "People from finance, who wouldn't know a Pentium from a bicycle, look at IS changes in terms of cost," Shaffer says. "That's not the kind of planning you need at the CIO level because IS is a process, not a thing."

Most of you agree, it seems, often citing the pace of technological change as the reason why business acumen alone won't cut it.

"As technology evolves to a truly more difficult and technical environment, a CIO without an IS background can't weigh the issues of where to apply the technology, how to apply it and IS' role in developing and deploying that technology," Harper says.

So does that mean, by inference, that training IS personnel to be business-minded is another short-lived fad? It depends on how you define "business-minded," you told us. If it means minding the bottom line, forget it. But if it's imbuing the needs of the company in all IS activities, then it's very real and critical.

"IS' role is to support the business, and to do that, it needs to be a part of the business," says Thomas Murphy, director of MIS at Bruce McGaw Graphics in New York. "To do their jobs correctly, my staff needs to know what makes our business run."

Looking into the future

Which brings us to the question of what will run IS five years from now. Not an Apple Computer, Inc. server or Digital Equipment Corp. Alpha chip, you say.

The reasons you gave were varied. Oh sure, there were complaints about Apple's inability to come up with a decent server and the probability that the high-speed Alpha chip today will look like the 8088 tomorrow. But among the readers we spoke with, the most cited reasons came down to the feeling that neither Apple nor Digital will be a major player in five years.

"I'm skeptical that Apple will survive in the current climate," says Howard Halpin, senior vice president of information and technology at the Aircraft Owners and Pilots Association in Frederick, Md. "If they do survive, it will be strictly in niche markets."

One such niche could be for personal digital assistants. Readers predicted they would not be in widespread use in five years, but they would still be around (along with pen computing, neural networks and voice-operated computing).

Still, it's a bit of a shock to find that many readers think these technologies have a future. Listen closely to the pen computer market, for example, and you can hear its death rattle.

Why any optimism at all. "I don't think any technology ever purely dies," says David Lozupone, director of MIS at Columbia Artists Management, Inc. in New York. "It either ends up in some niche or evolves into something else."

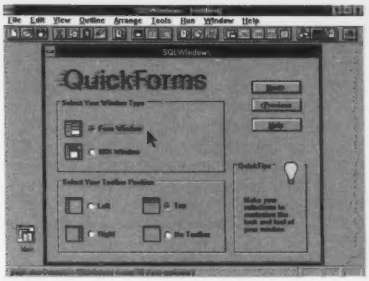
And that, it turns out, sums up why so many readers think these technologies will eventually find a use and a market. And it just proves that skepticism — and optimism — often show up in the most unexpected places. ■

Garner is a free-lance writer in San Carlos, Calif.

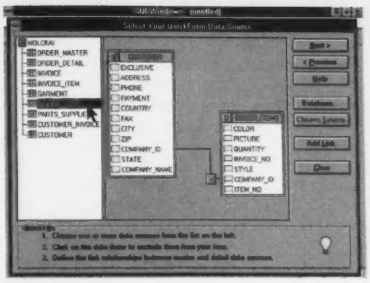
Tarnished trends and technologies

Respondents found the following products, trends and technologies as the least likely to make the grade in five years:

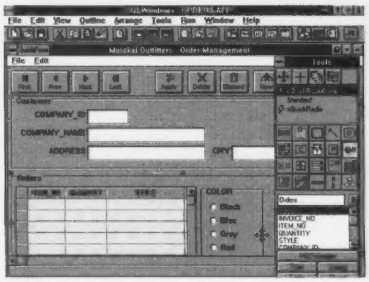
PRODUCTS	TRENDS	TECHNOLOGIES
■ Apple servers	■ Pen computing	■ Alpha
■ Pentium-upgradable 486 PCs	■ Neural networks	■ Smalltalk
■ Personal digital assistants		■ OS/2
		■ Solaris



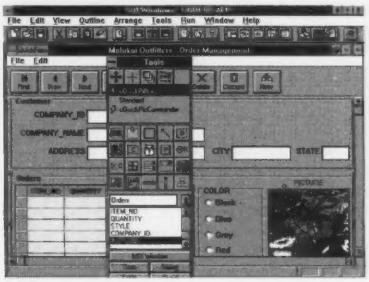
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4 What good are color selections in a Hawaiian shirt company if your can't see them? SQLWindows applications can easily incorporate graphical data from any file, OLE server or database, with the QuickPicture QuickObject. Just place and size the picture box in your form. See? You still haven't written a lick of code!



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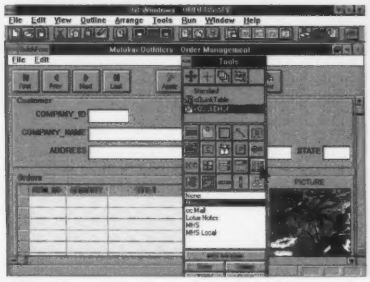
Now, client/server applications are in your grasp. New QuickObjects from Gupta make "drag & drop" application development a productive programming alternative to dreary, repetitive coding. In fact, any developer can now build full-featured client/server applications regardless of prior experience. Novices can skip complicated coding and veteran developers can boost productivity before resorting to code for extended functionality.

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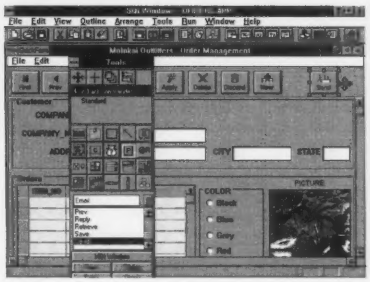
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6 For instance, each order will require credit approval. This calls for an e-mail QuickObject, a pre-defined pushbutton with built-in code to execute e-mail tasks. To run credit checks via e-mail, choose the "Send" e-mail QuickObject and drop a "Send" button on your form's toolbar. Now any user of the application will be able to notify the Credit Department when an order is placed and secure their approval to ship – all via e-mail without leaving the application.

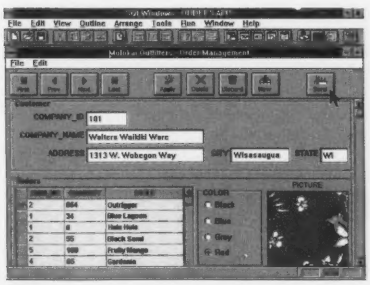
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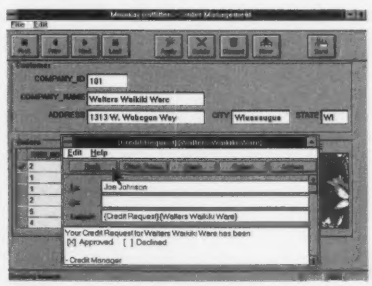
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7 Now, test your application. Click on the "Run" button in the SQLWindows toolbar. Any errors will be flagged by the internal debugger and a runtime application will be created. Then, for blazing speed, just punch the adjacent SQLWindows Compiler button to tap the performance of the industry's first 4GL compiler.



8 Congratulations. You've just built a powerful client/server mail-enabled application that integrates graphical and SQL data anyone can use. And you did it in less than 15 minutes! Now, *Walter's Waikiki Ware* in Wisconsin will get the 72 dozen Outrigger shirts they need by next week, and you'll be modeling Molokai Outfitters' latest styles on the very beaches that inspired them.

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Allan E. Alter

Leadership vs. leaderhype



Pity the poor CIO. Besides the latest techno-boggle, he must put up with another form of vaporware.

Call it leaderhype.

CIOs are constantly told they should seize the day and take a leading role in their companies, that it is their manifest destiny to drive change and steer their company into a radiant, technology-enabled future. And ever since re-engineering arrived on the scene, IS executives have been told that this latest business nostrum provides a wonderful opportunity for CIOs to extend their influence.

Well, here's a two-word answer for that sort of talk: Get real.

Maybe there's some parallel universe where IS executives are the vanguard of the management class. It certainly isn't this universe, and most CIOs know better.

The point was brought home for me on a hot July day in Cincinnati, where I joined 25 veteran Fortune 500 IS executives gathered under the auspices of the Conference Board.

A senior vice president at a leading consulting firm (who must remain nameless under the terms of my invitation) gave a presentation on the implications of re-engineering for CIOs. He told the group that business re-engineering offers technology a seat at the executive table. It provides an opportunity for the chief technology officer to step up to a broader role as chief change agent.

The attendees cut him off at the knees. One after the other, they said that in the real world, IS executives almost never lead or introduce organizational change in their companies.

Kathy Brittain White, an IS vice president at Allied Signal, Inc.'s Engineered Materials business unit, was one of those in the room. Her views were typical of the group: "Most of us are not positioned to come in and tell a business what to do. We can be part of the process but not be the head of the process. That is not the role most companies allow us to play," she told me.

Maybe there's some parallel universe where IS executives are the vanguard of the management class. It certainly isn't this one.

Exception to the rule

Yes, there may be occasions where personalities, executive egos, corporate culture and skills are aligned in such a way that the right CIO can be the chief change agent. And sometimes comets smack into Jupiter, too. Such events are exceptions, not everyday occurrences. Generally, the best that CIOs can reasonably expect is to be partners — and usually junior partners — with non-IS management in helping to institute change.

It isn't that these CIOs are wimping out or are congenital introverts. And it isn't that CIOs lack experience as change agents, for who does have that kind of experience? It's simply that few IS executives have the experience that most impresses other executives: experience running businesses.

Furthermore, few CIOs enjoy the institutional standing that comes with being a corporate officer or director. Most haven't built the kind of trust that comes with lengthy service at one company and haven't inherited a position that historically carries clout. And, according to White, there is no law that says other executives have to cooperate or get along with the CIO.

In his article "What Makes A Good Leader?" published in the April 1994 issue of the *Atlantic Monthly*, the Pulitzer Prize-winning historian Gerry Wills observes that there are no leaders without followers and that in a democracy, "the leader is one who mobilizes others toward a goal shared by leader and followers."

But what worked for Franklin D. Roosevelt cannot work for CIOs. He had to persuade millions of voters to elect and reelect him to several four-year terms. CIOs, on the other hand, are appointed and fired at the whim of one person. They must appeal to executives who do not like to think of themselves as followers. Most importantly, CIOs are responsible for technology, and technology is not a goal but a tool.

For CIOs, effective leadership isn't primarily about finding followers; it's about building voluntary partnerships with strong-willed executives who also think it's their job to be change agents — and who may actually be right.

IS executives who overstep those bounds are far more likely to wind up victims of leaderhype than paragons of IS leadership.

Alter is *Computerworld*'s senior editor, management.

Executive Track

VSI Enterprises, Inc., a videoconferencing systems development company in Norcross, Ga., has announced the appointment of **Leo M. Cortjens**, 40, as president and chief operating officer. He succeeds Paul A. Scott, 44, who left the company in June. Cortjens was formerly vice president of technology at the company.



Ann M. Purr has been elected president-elect of the **Association for Systems Management** (ASM) in Cleveland. Purr is assistant vice president of information management products and services at the Life Office Management Association, where she has worked for 17 years. She has been an ASM member since 1978. She is a member of the Atlanta chapter of ASM and has held numerous positions at every level of the association. In 1990, she earned the association's Distinguished Service Award for outstanding contributions.

The Internal Revenue Service has announced the appointments of **Angela P. Mackson** as assistant regional commissioner for data processing in the IRS' central region and **Charles W. Peterson** as assistant director at the Philadelphia Service Center. Mackson will be responsible for assisting the regional commissioner in planning, coordinating and evaluating returns processing, computer services, revenue accounting, public affairs and taxpayer service activities at the central regional office. The central region includes Cincinnati, Cleveland, Detroit, Indianapolis, Louisville, Ky., and Parkersbury, W. Va. Peterson will assist the service center director with processing federal tax returns and other services for taxpayers in Delaware, Maryland, Virginia, Pennsylvania, the District of Columbia and Puerto Rico.





Alydaar Software Corp. in Madisonville, La., has announced the appointment of **Daniel M. Brandon** as director of data management technologies. He will be responsible for developing the company's database translation and migration re-engineering projects. Prior to joining Alydaar, Brandon was director of information systems for the prime technical contractor at NASA-Stennic Space Center. While at NASA, Brandon oversaw applications design and development, systems administration, data communication and all strategic IS planning, including migrating applications from mainframe to client/server.

MapInfo Corp. in Troy, N.Y., has announced the appointment of **Kirvan H. Pierson III** as a director of software development. Prior to joining MapInfo, Pierson was a manager of software development at Roadnet Technologies, Inc., a subsidiary of United Parcel Services, Inc.



J. P. Morgan & Co. in New York has announced the appointment of **William M. Hewitt** as vice president. He will be responsible for managing relationships between the corporate technology division of the investment bank and the divisional businesses it serves. Prior to joining J. P. Morgan, he was manager of marketing operations at IBM subsidiary Integrated Systems Solutions Corp.'s disaster-recovery facility in Sterling Forest, N.Y.

Stanford University in Stanford, Calif., has announced the appointment of **Glen Mueller** to the newly created position of chief information officer for the university's Libraries and Information Resources Division. The appointment comes in the midst of the division's reorganization. Meuller will be responsible for the development and operations of networking and communications services, information systems, data administration and technology support for instruction, research and administrative activities. Mueller had been director of internal audit at Stanford. In addition to Mueller's appointment, **Michael Keller** has been appointed Ida M. Green University librarian and director of academic information resources. Keller will be responsible for maintaining the integration of the libraries and academic information resources, as well as some networking and communications services. Both Mueller and Keller will report to Chief Academic Officer Provost Condoleezza Rice. The division's reorganization was driven by the need to overhaul the university's administrative computer system.

Grant Thornton, the international accounting and management consulting firm, has announced the appointment of **Mark Oster** as senior manager in the management consulting practice. He will work with clients to address information technology business strategies, financial planning, operations management, productivity improvement, product liability and litigation support. Prior to joining Grant Thornton, Oster held senior information systems management positions at Simon and Schuster, Philip Morris Co. and Arthur Andersen & Co.



Cargill, Inc. in Minneapolis has announced the appointment of **Guillaume Bastiaens** as president of the company's food sector. Prior to his appointment Bastiaens was chief technology officer at Cargill.



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Seminar Dates and Locations

Northeast

Hartford, Connecticut
Sept. 14, Oct. 18

Stamford, Connecticut
Sept. 29

Wilmington, Delaware
Oct. 5

Boston, Massachusetts
Sept. 15, Oct. 13, Nov. 15, Dec. 6

Saddlebrook, New Jersey
Sept. 28, Oct. 26

New York, New York
Sept. 13, Oct. 11, Nov. 8, Nov. 29

Albany, New York
Oct. 12

Rochester, New York
Sept. 20

Providence, Rhode Island
Sept. 22

Philadelphia, Pennsylvania
Sept. 27, Oct. 25, Nov. 21

Pittsburg, Pennsylvania
Oct. 4, Nov. 1

Mid-Atlantic

Washington, DC
Sept. 14, Oct. 19, Nov. 16, Dec. 7

Baltimore, Maryland
Sept. 15, Nov. 2

Raleigh/Durham, N. Carolina
Sept. 20, Oct. 25

Charlotte, N. Carolina
Sept. 29, Oct. 26

Richmond, Virginia
Sept. 21, Oct. 13

Southeast

Orlando, Florida
Sept. 27, Oct. 20

Miami, Florida
Sept. 22, Oct. 18, Nov. 17

Atlanta, Georgia
Sept. 13, Oct. 11, Nov. 9

Central South

New Orleans, Louisiana
Oct. 5, Nov. 8

St. Louis, Missouri
Sept. 13, Oct. 12, Nov. 10, Nov. 29

Kansas City, Missouri
Oct. 6, Nov. 3

Nashville, Tennessee
Sept. 22, Nov. 15

Central North

Louisville, Kentucky
Oct. 6, Nov. 17

Chicago, Illinois
Sept. 13, Oct. 11, Nov. 8, Nov. 29

Indianapolis, Indiana
Sept. 28, Oct. 25

Evansville, Indiana
Sept. 27

Des Moines, Iowa
Sept. 22, Oct. 13

Detroit, Michigan
Sept. 20, Oct. 12, Nov. 16, Dec. 6

Ann Arbor, Michigan
Oct. 19

Minneapolis, Minnesota
Sept. 15, Oct. 4, Nov. 1, Nov. 30

Cleveland, Ohio
Sept. 29, Oct. 27

Columbus, Ohio
Sept. 21, Nov. 9

Cincinnati, Ohio
Oct. 5, Nov. 10

Milwaukee, Wisconsin
Sept. 14, Nov. 2

Madison, Wisconsin
Oct. 12, Nov. 17

Central West

Denver, Colorado
Sept. 15, Oct. 11, Nov. 8

Colorado Springs, Colorado
Sept. 29

Kansas City, Kansas
Sept. 20, Nov. 16

Omaha, Nebraska
Sept. 21, Oct. 18

Tulsa, Oklahoma
Sept. 14, Nov. 2

Houston, Texas
Sept. 27, Oct. 25, Nov. 22

Dallas, Texas
Sept. 13, Oct. 6, Nov. 1, Nov. 29

Austin, Texas
Oct. 20

Southwest

Phoenix, Arizona
Sept. 22, Oct. 20, Nov. 9

Las Vegas, Nevada
Sept. 15, Nov. 2

San Diego, California
Oct. 4, Nov. 1

Los Angeles, California
Sept. 20, Oct. 18, Nov. 15, Dec. 6

Orange County, California
Sept. 21, Oct. 19

Sacramento, California
Sept. 28, Oct. 26

San Francisco, California
Sept. 13, Oct. 12, Nov. 10, Dec. 7

Oakland, California
Sept. 27, Nov. 22

San Jose, California
Sept. 14, Oct. 11, Nov. 8

Salt Lake City, Utah
Sept. 29, Oct. 27

Northwest

Portland, Oregon
Sept. 22, Oct. 27

Seattle, Washington
Sept. 21, Oct. 19, Nov. 16

Anchorage, Alaska
Oct. 4

Canada

Toronto, Ontario
Sept. 20, Oct. 25, Nov. 8, Nov. 28

Montreal, Quebec
Sept. 21, Sept. 22

Ottawa, Ontario
Sept. 27, Oct. 26

Calgery, Alberta
Oct. 5

Regina, Saskatechewan
Sept. 13

Edmonton, Saskatechewan
Oct. 6, Nov. 3

Vancouver, British Columbia
Sept. 14, Oct. 18

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Calendar

OCT. 2-8

The 1994 Computer Training & Support Conference. Atlanta, Oct. 2-5 — Topics: management challenges, retooling, training, workplace technology, interactive multimedia, service excellence, documentation, certification and testing. Contact: Ziff Institute, Cambridge, Mass. (617) 252-5187.

The Annual Data Administration/IS Conference & Trade Show. Orlando, Fla., Oct. 2-5 — Contact: Data Administration User Group, Bayonne, N.J. (201) 823-4800.

The East-West Conference. Knoxville, Tenn., Oct. 2-5 — Showcases business and trade opportunities in European, Asian and Canadian markets and highlights two panels on the topics of technology transfer and the information superhighway. Contact: University of Tennessee Conference Center, Knoxville, Tenn. (615) 974-0250.

Strategic Multimedia Conference: Opportunities for Multimedia in the 1990s. Lake Buena Vista, Fla., Oct. 3-4 — Contact: TWA/Frost & Sullivan, Santa Clara, Calif. (800) 256-1076.

1994 National Association of State Information Resource Executives (NASIRE) Annual Conference. San Francisco, Oct. 3-5 — Theme: "Blazing the Trail: Shaping Information Technology." Topics: economic development, procurement laws/practices, electronic commerce, funding issues for information resources and public/private partnerships. Contact: Mary Alice Sosby, NASIRE, Lexington, Ky. (606) 231-1905.

Power '94: The Second International Conference on Power Requirements for Mobile Computing and Wireless Communications. Santa Clara, Calif., Oct. 3-5 — Topics: batteries, semiconductors, portable computing, cellular devices and services, software peripherals, components and systems integrators. Contact: BIS Strategic Decisions, Norwell, Mass. (800) 874-9980.

Wireless World Expo '94. Orlando, Fla., Oct. 3-5 — Contact: E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

Software Development SD '94. Washington, Oct. 3-6 — Contact: Miller Freeman, Inc., San Francisco, Calif. (415) 905-2784.

Gartner Group Symposium/Information Technology Expo '94. Lake Buena Vista, Fla., Oct. 3-7 — Presentations include five-year strategic planning scenarios, roundtable discussions and product education sessions. Contact: Gartner Group, Inc., Stamford, Conn. (203) 967-6871.

Supporting & Troubleshooting OS/2: Practical Guidelines for Installing, Maintaining and Enhancing the OS/2 Environment. Washington, Oct. 4-5 — Also showing in San Francisco, Oct. 18-19. Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400.

Unix Expo. New York, Oct. 4-6 — Keynotes: Tim O'Reily, president, O'Reily and Associates, Inc., speaking on "The Internet and its Role in the Business Communuity; and Lawerence J. Ellison, president and chief executive officer, Oracle Corp., speaking on "Parallel Software for Information Management." Full conference fee: $320 in advance, $360 on-site. Contact: Annie Scully, Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

Eighth Annual Idaho National Engineering Laboratory Computing Symposium. Idaho Falls, Idaho, Oct. 4-7 — Contact: EG&G Idaho, Inc., Idaho Falls, Idaho (208) 526-7785.

Law conference addresses Internet issues

The growing and complex legal questions regarding conducting business on the Internet will be the subject of a two-day conference in New York, Sept. 29-30.



The conference, Legal and Business Aspects of the Internet and Online Services, is being sponsored by Law Journal Seminars-Press in New York. It will be held at the New York Hilton Hotel.

The conference will focus on issues of intellectual property, communications and entertainment law. Seminars will include such topics as privacy — corporate and personal, doing business on-line, crime on the networks, current and pending legislation and the National Information Infrastructure.

The event's chairpeople will be Ellen M. Kirsh, vice president, general counsel and secretary of America Online, Inc.; Lance Rose, Latice Rose & Associates; and Shari Steele, director of legal services at the Electronic Frontier Foundation.

For more information or to register, contact Jill Windwer at (800) 888-8300, ext. 6141, or via the Internet at windwer@delphi.com.

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21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr.: Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin Svs.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

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11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

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65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
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41. Engineering, Scientific, R&D, Tech. Mgt.
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70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

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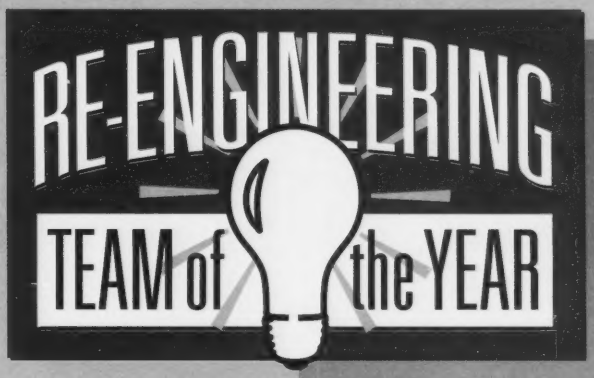
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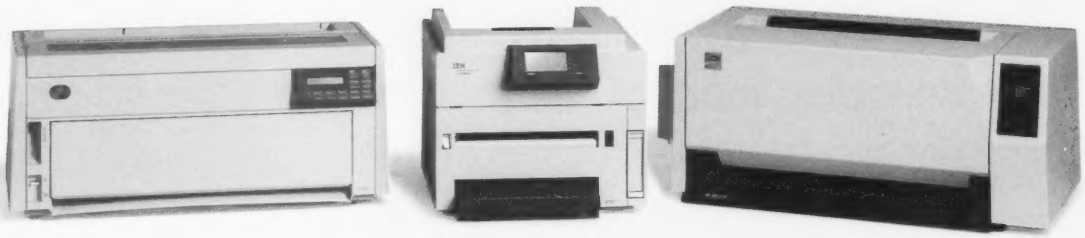
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ROUNDTABLE

Trials and Tribulations



ALL PHOTOGRAPHS BY MARVELLO PAGANELLI

By Paul Gillin

MULLING A MOVE to client/server? You're not alone. A recent survey by *Computerworld Client/Server Journal* found that 36% of 200 organizations surveyed have large-scale applications already deployed in a client/server setup. But the move from the host environment is formidable and fraught with difficulties. To find out what those are, *Computerworld* Editor Paul Gillin sat down with information systems managers at four companies that set up mission-critical client/server applications. They spoke at the Client/Server Conference & Exposition in Washington late last month.

CW: Where do you stand in your move to client/server?

WOODS: We're well down the road to implementing all our engineering and manufacturing processes on client/server. Our primary motivation is the mother lode of innovation at the client/server level.

There's absolutely no worthwhile software being developed on mainframes or minicomputers.

Trials and tribulations, *page 112*

Who The Panelists Are:



Mike Knellinger



Ted Mountzuris



Jim Woods



Ian Miller

Mike Knellinger, director of information systems at Mead Data Central in Dayton, Ohio, is using ProTeam from Scopus Technology in Emeryville, Calif., to develop a customer support application.

Ted Mountzuris, director of application development at General Cinema in Chestnut Hill, Mass., is using SeQueL to Platinum from Platinum Software Corp. in Irvine, Calif., to develop a financial reporting application.

Jim Woods, chief information officer at Hughes Aircraft Co. in Los Angeles, is using Sherpa from Sherpa Corp. in San Jose, Calif., to integrate and manage engineering and manufacturing operations.

Ian Miller, senior director of architecture and emerging technology at Merck & Co. in Whitehouse Station, N.J., is using integrated HRMS from Tesseract in San Francisco to manage human resources and payroll applications.

Trials and Tribulations

CONTINUED FROM PAGE 91

MILLER: We've been fairly aggressive in investing in client/server for certain classes of applications. It was important to learn which applications are suitable and which aren't.

MOUNTZURIS: We've deployed about seven applications, using primarily [Powersoft Corp.'s] PowerBuilder and Microsoft Access with [Sybase, Inc.'s] Sybase and XDB. We've got an order management system that's just been converted, and we're working on a companywide problem management system that's much more ambitious.

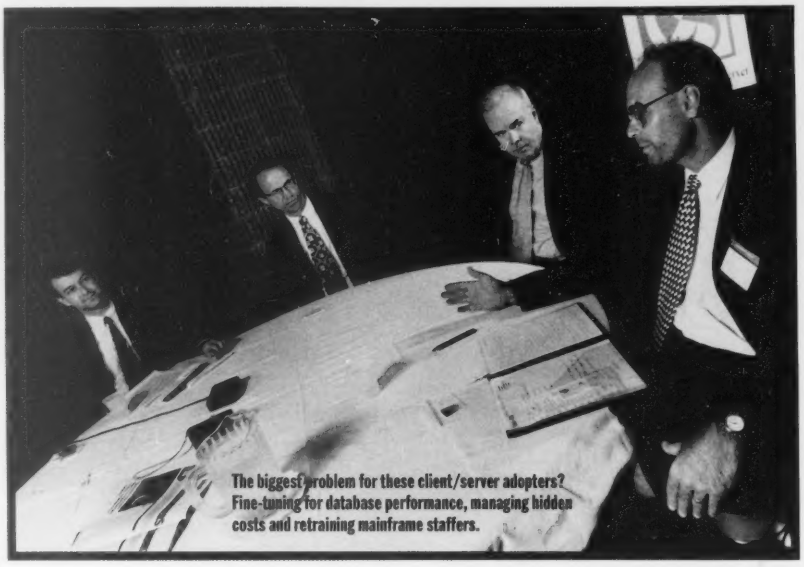
KNELLINGER: In the area of building databases and acquiring information to go into them, we date back to 1986 or 1987 in client/server. We are also taking the company's Lexis/Nexis service and moving that to client/server.



Jim Woods: *"We have to make breakthroughs in the way we do business or perish"*

CW: What were the biggest surprises you encountered on your first major client/server project?

WOODS: The biggest surprise is that I'm dealing with companies that weren't in business three years ago, companies whose annual sales volume is half or less of my operating budget. I've moved from a career dealing with Hewlett-Packard and IBM to dealing with Sherpa or Western Data Corp. or Hughes LAN Systems or SynOptics. After about the fifth or sixth time we had committed our corporation to a $10 million or $20 million concern, my chairman of the board said he had a metric for me. He said, "Jim, the mean time between failures of the companies you do business with has to be equal to or greater than your retirement date."



The biggest problem for these client/server adopters? Fine-tuning for database performance, managing hidden costs and retraining mainframe staffers.

KNELLINGER: If you go in expecting your systems are going to last 15 to 25 years, you're going to be surprised when people come back in three years wanting to do things over again. For some people, that's a shock.

MILLER: The cost of managing the desktop components was higher than we imagined it would be. We have about 12,000 desktops. The cost of distributing one new application has run to six figures.

MOUNTZURIS: The biggest surprise is the hidden costs, especially in development tools. You find out you need DLL for this, an API for that, a connection to other databases, and that's all additional cost. And the software that vendors are selling has bugs like nothing I've seen in the past.

CW: Have any of you migrated transaction-intensive applications to client/server?

WOODS: Yes, in product data management. Our engineering and manufacturing release system is based on a commercial product called Sherpa and embodies all the information it takes to design, manufacture and field our products. We have it installed in nine sites processing tens of thousands of transactions a day.

CW: Did it replace a mainframe?

WOODS: Yes. Performance is reasonable, but we built the infrastructure around this product, which we can't afford to do on a per-application basis.

MILLER: We put our sales-order processing applications in a client/server environment from a mainframe system with AS/400s in the field. We had to learn how to engineer Oracle databases so they perform well in client/server. The other challenge has been operations and maintenance of equipment. Handling a couple of boxes is one thing; managing a series of boxes in a data center is another.

MOUNTZURIS: Performance tuning is the big thing. When we initially went to client/server, we started on an Intel platform and scaled up to Unix because of performance issues.



Ted Mountzuris: *The biggest surprise is the "hidden costs ... You find out you need a DLL for this, an API for that, a connection to other databases ..."*

MILLER: We're having the same issues. In early attempts to move away from the mainframe, we threw out the baby with the bathwater. In avoiding things we didn't like about the mainframe, we lost some of the things we did like, such as security and control. Now we're struggling to get that back in the new environment.

CW: If you had the chance, would you do client/server again the same way?

WOODS: You don't get to vote. Today, your company can't compete on technology or price alone. There's the need for breakthrough gains with very high rewards and risks. We used to spend years in operating systems conversions on the mainframe. Now we're trying to turn the whole company around in 18 months. We have to make breakthroughs in the way we do our business or perish.

KNELLINGER: If we were to do it again, I'd adopt more of the mainframe discipline and use more large servers ... and fewer of them.

CW: Did you attempt to cost-justify client/server projects?

MILLER: We try not to take technology and reason backward but take a business initiative and reason forward. We have to justify the costs not just from the IS standpoint but from the standpoint of the overall business initiative.

MOUNTZURIS: The only way client/server is going to be a success is if you change what you do. We were off by a couple of million dollars on our [return on investment on one project]. The bulk of it was time. It was defined as a nine-month project. After we went through all the training, it took 18 months.

WOODS: I have a simple rule that if you don't re-engineer the process, I don't automate it. Had we had that kind of rule back in the mainframe days, we might have been a lot more successful than we were. What we're doing differently now is not so much client/server, but having the processes drive the application.

Trials and tribulations, *page 97*

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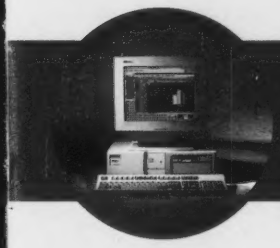
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Integrated Networking Interface	32-bit	16-bit		
Integrated, multiprotocol Boot-ROM	X	X		
ISA Plug-n-Play Compliant	X	X	X	
Multilevel Security Features	X	X	X	X
Asset tracking	X	X	X	
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Bi-directional parallel port	X	X	X	X
Desktop Management Interface (DMI)[3]	X	X		

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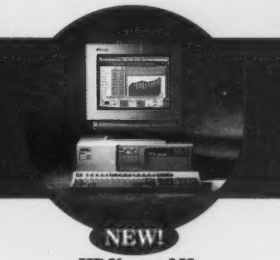
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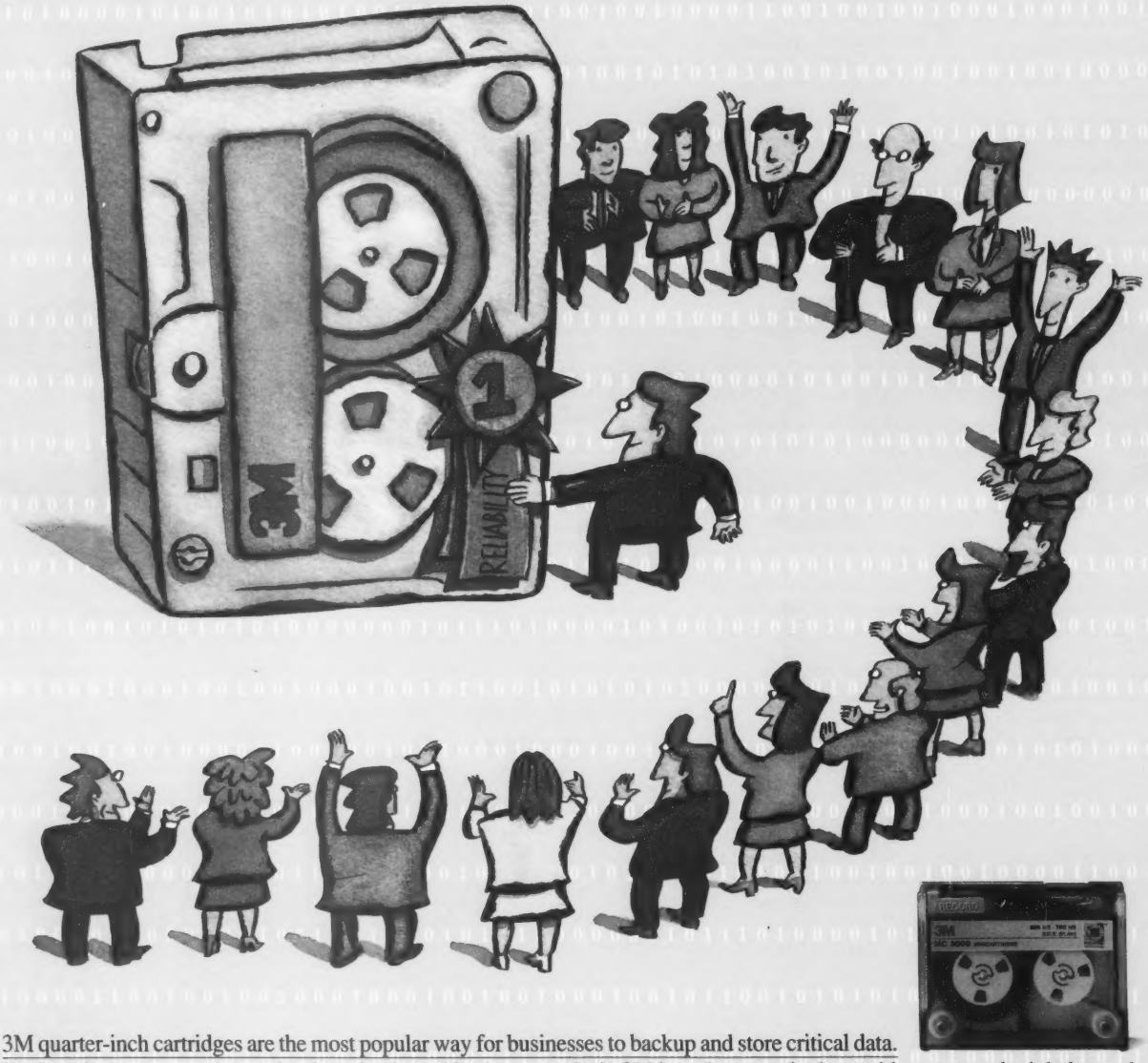
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Trials and Tribulations

CONTINUED FROM PAGE 92

For example, in product data management, we're going to spend $67 million over five years. Forty million dollars of that is in the operating units, and the bulk of that is people costs for reeducation, reprocessing and redesigning applications.

KNELLINGER: We ignore the fact that client/server is an enabling technology, and it's hard to quantify that. I call it the *Field of Dreams* thing: If you build it, they will come. We've found in some places where we've implemented client/server [that] it's generated a whole cadre of ideas for business improvement. That doesn't show up in a business case.

CW: Is client/server saving you money?

MOUNTZURIS: Some projects have. We developed a budget and [profit and loss] system that used to cost $120,000 a year. Now it costs about $2,000. The system took 13 months to develop on a mainframe. It took us three months on a PC. However, other projects don't give you paybacks before 24 months.

MILLER: We have client/server systems that have saved us money, but I'm not sure they wouldn't have saved us money on the mainframe.

What client/server has done is gone beyond putting data into a system to giving people data and the ability to analyze it. People do things they couldn't have done before because they didn't have access to the information.



Ian Miller: *"Our mainframe is growing, not rotting on the vine"*

CW: But how do you quantify that?

WOODS: Competitive survival. As a global company, we're moving to worldwide engineering and manufacturing. Our engineering staff may be in southern California, our manufacturing staff in Tucson, our quality staff in Washington and our field office in Brussels. Distributed computing environment will allow for this. We couldn't have done it without this enabling technology.

CW: How did you handle the staff changes that are required within IS?

MOUNTZURIS: We attempted to train the individuals who were more mainframe-oriented. Some people did not want to change at all. We went through a major reorganization of that department, hired professionals who were skilled in [Microsoft's] Visual Basic, C++, PowerBuilder, Sybase and client/server. It costs more, but we have very high skill sets. We want to do more with fewer, very skilled people.

CW: You've cut a lot of people too, then?

MOUNTZURIS: Yes.

MILLER: Our mainframe is growing, not rotting on the vine. We have clinical work on the mainframe, a lot of manufacturing planning, financials. People who want to work in that environment aren't going to lack for things to do.

WOODS: I have the opposite situation. Three years ago we employed 800 people in the mainframe area. Today it's about 260. The people who believe in lifelong learning are still with us, but a lot of people couldn't make this change, not just in [information technology] but in every aspect of the business.

KNELLINGER: We took a 45% cut in our IS staff last summer. To offset that we doubled the amount we were spending on training. Mainframe approaches built up a lot of bureaucracy in time spent haggling over requirements. Client/server brings iterative development to bear rather than the customer handing off written requirements. One good way to convert people from mainframe to client/server thinking is to show them the want ads in the Sunday paper.

MOUNTZURIS: Terminating people is the easy way out. You have to give them the opportunity to learn a technology, to make them skillful enough that they'll be able to find a job on the market.

CW: What percentage of your people, realistically, will not make the transition?

WOODS: You know fairly soon who the adapters are. People who didn't adapt [at Hughes Aircraft] were like deer in the headlights. We had many people who froze at object-oriented and client/server technology. [The problem is that] people's fear made them less productive. We probably had 50% of the staff who couldn't change. It's very difficult. I don't think any of us who've been in [information technology] for a long time were trained in the human management issues.



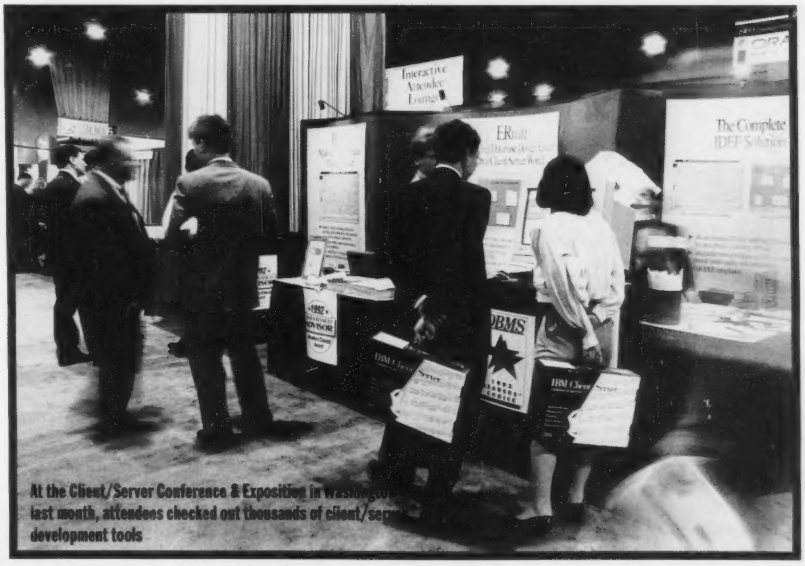
Mike Knellinger: *"We've found in some places [that implementing client/server] has generated a whole cadre of ideas for business improvement"*

CW: Can you name one product you couldn't do without in the move to client/server?

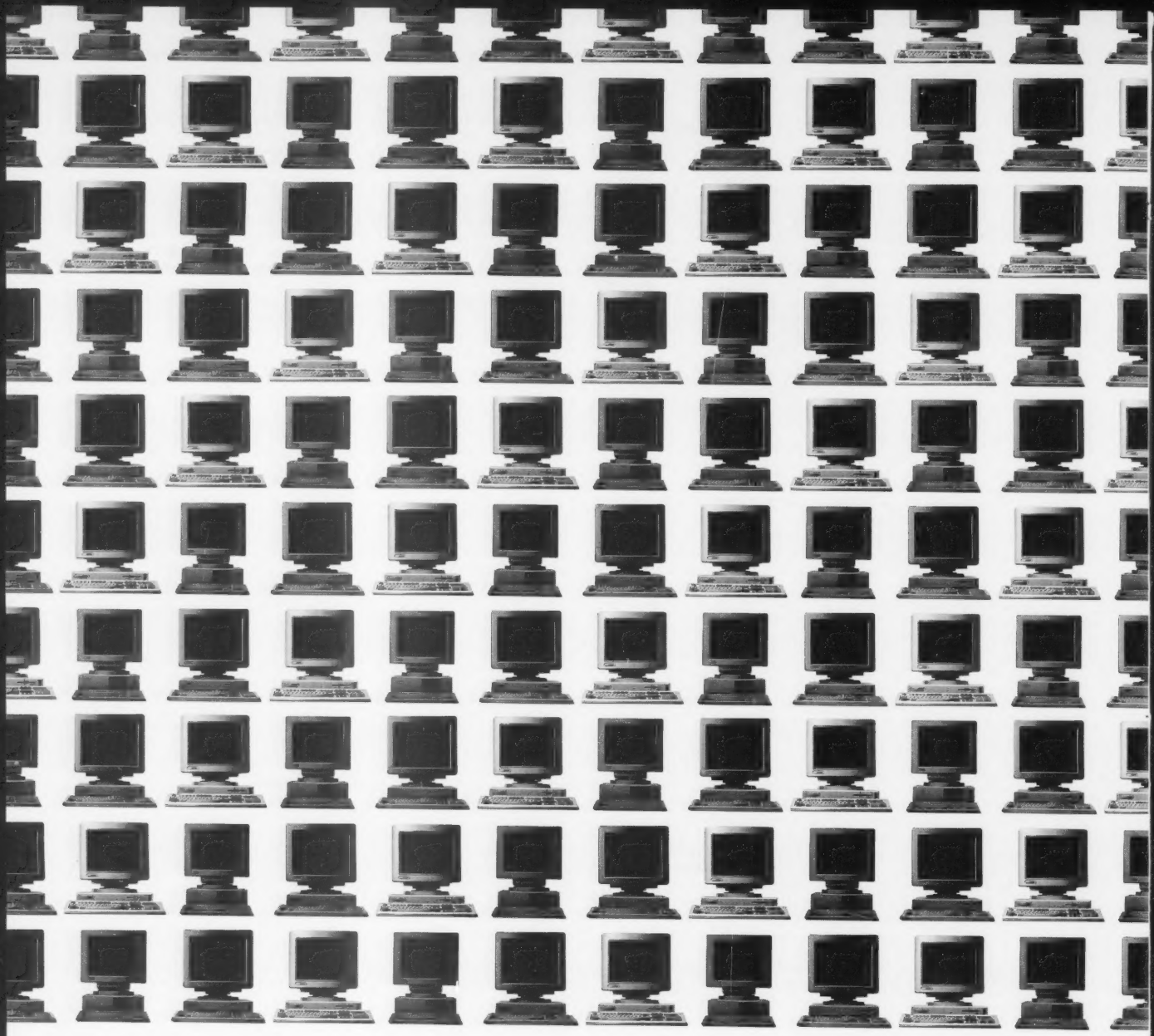
WOODS: I have 500 LANs to control, and you can't do that without effective systems management. The Tivoli suite of network and operations management software allows us to do systems and network operations and help desk tracking that are similar to what we had in the mainframe environment. I've mentioned some [independent software vendors], Sherpa being the most significant.

KNELLINGER: PowerBuilder allowed us to do some fairly customized development. The second product was one from Scopus [Technology] that gave us an off-the-shelf way to do global problem management within the company. It attacked the problem of the heterogeneous desktop environment we had.

MOUNTZURIS: The most critical is system management tools. Because we're a heavy PowerBuilder shop, we invested in a product [designed to work with PowerBuilder] called PowerTool from PowerCerv in Tampa, Fla. It allows us to develop object-oriented code more efficiently. ■



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Life without Wires

By Bronwyn Fryer

It's coming, so you might as well learn the ropes. Rapidly improving technology has made wireless networks a little easier to implement, but analysts say most IS staffs are not prepared for the task.

Don't expect to find Cheryl Currid at her desk answering the dozens of electronic-mail messages she receives daily. An enthusiastic user of her wireless modem, the president of Currid and Co. in Houston prefers messaging from the road. "I'm totally addicted to doing my E-mail in taxicabs," Currid says. "It's very stable and works very well with short transmissions."

She's not alone. In the world outside the climate-controlled information systems environment — where the company's proverbial rubber meets the road — sales, service and support representatives must turn on a dime to retain customer satisfaction.

To keep field forces nimble, more organizations are providing users with wireless devices ranging from long-established items such as cellular phones and pagers to technologies involving more brain power, such as personal digital assistants, laptops and palmtops equipped with specialized mobile radio modems.

The use of such wireless networks is expanding rapidly. Last year alone, United Parcel Service, Inc. installed two-way wireless communications technology on 60,000 of its trucks. Wireless providers also cite a growing number of converts: ARDIS claims 35,000 current users, and RAM Mobile Data claims 12,000 users. By 1996, subscribers to such networks are expected to grow to 22 million.

The IS hurdle

Unfortunately, most IS staffs are ill-prepared to deal with the wireless onslaught, says Ira Brodsky, president of DataComm Research Corp. in Wilmette, Ill. "Many IS departments get forced into this because Operations says, 'We have to have this. It's your job to figure it out.'"

Although the adoption of wireless technology is seen as increasingly critical, IS can find itself sandbagged by the complex new technology. If you're thrown to the lions, the issues that will affect you most include the following:

▶ **Planning:** Many companies are still undergoing sticker shock over the cost of wired LANs. A survey by Business Research Group in Newton, Mass., indicates that cost-justifying a wireless network — including installing a communications server and a database server, contracting with a service carrier and purchasing wireless modems for many users — can be tricky.

In addition, IS managers must think differently, Currid says. "Dealing with wireless is not a standard IS job. We're talking about empowering, enabling technology and designer appliances that people carry with them."

To that end, she argues, wireless technology broadens IS responsibilities. IS managers must be more nurturing and have an even more detailed understanding of how the end user works than when setting up the average LAN.

In the expanding world of wireless, IS managers must also wrestle with a mind-boggling array of choices when designing a wireless communications system. "IS must choose among a host of new technologies and players, and a novice can't sort them out," Brodsky says. "Everyone worries about betting on the wrong horse."

▶ **Monitoring the network:** In the complex world of wireless, where users are in a variety of unknown locations and pop in and out of the network, IS professionals must deal with issues ranging from quality changes to delays. "In a wired LAN, you can monitor users easily. In a mobile environment, you don't know where they are," Brodsky says.

This issue is complicated by a lack of off-the-shelf network management tools for wireless networks, though some ven-

Wireless, *page 101*

In the works

If your company hasn't gone wireless yet, a shift to the emerging technology may be in the cards. Technologies that many companies are at least considering include the following:

Wireless data network types

	Considering	Planning
Wireless LAN	57%	42%
Cellular	49%	36%
Paging	28%	20%
Specialized Mobile Radio	26%	18%
Wireless packet	23%	14%
Satellite/VSAT	22%	18%
Other	6%	4%

Base: 171 respondents, multiple responses allowed
Source: Business Research Group, Newton, Mass.

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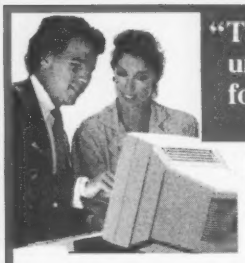
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Continued from page 99

dors can provide status and updates and logging services. "That's an area that needs to mature," says Laura Battafarano, mobile computing consultant at KPMG Peat Marwick in Radnor, Pa. In most cases where wireless is currently installed, network management tools must be custom-built, but expertise in this area is still limited.

▶ **Managing user expectations**: IS staffers must warn users that "going wireless" is not the same as working in the office.

For example, because current wireless products are slow due to low bandwidth, "users who are accustomed to having instant live access to data may become frustrated by having to deal with 1,200 bit/sec. transmission rates," Brodsky says. For that reason, only a few applications are as yet really appropriate for wireless.

"Right now, wireless is great for transmitting short textual information under 10K bytes," Currid says. "But you can't send a 2M- to 3M-byte PowerPoint piece."

In addition, wireless is not available in every area. IS managers who are early adopters of wireless must let users in out-of-the-way locations know that coverage may go away.

Finally, the equipment is bulkier than most cellular phones or pagers. Weighing in at around 1½ pounds, "the radios are fairly big and bulky like a double VCR tape," Currid says. "Executives may not want to carry all that gear."

▶ **Application development**: Applications for wireless devices must be modified to operate over low bandwidth. "You can't just take an application and throw it in the field," Brodsky says. "You must know how to filter the key information, and it involves more than developing a new user interface."

First, IS professionals must learn how transmission over infrared or packet radio works if the wireless system is used for an application such as E-mail. Remote user machines must be carefully installed. In addition, application interfaces must be tailored. Instead of developing a new interface, developers must find ways of actually stripping down applications to their barest form, such as automatic stripping of the formatting in a word processing document. They may also have to create Dynamic Data Exchange or Object Linking and Embedding links between applications and wireless devices. "There's a lot more development effort in wireless than a lot of people anticipate," Brodsky notes.

▶ **Support**: Because expertise in the field of wireless communications is still comparatively rare, most organizations find they must put extra effort into internal training. In addition, most opt to outsource support to the vendor or a consulting firm. However, "unless the wireless network is to be used on a 24-hour-a-day, 7-day-per-week basis, there is usually no need to provide round-the-clock support," Currid says.

Battafarano adds that most of her clients farm out a portion of their support tasks but also custom develop applications for the communications server, depending on the application.

Worth the effort

Despite such needs, Currid says instituting a wireless technology plan is "not the technological nightmare" it appears to be because the technology and offerings are improving rapidly.

In the long run, she adds, those who learn to manage wireless networks will help their career. "Wireless is a technology that most people will want, and it's part of everyone's future," she notes. "It's an important specialty that's a good one to go after." ■

Fryer is a free-lance writer in Boulder Creek, Calif.

Walgreen goes wireless

When it comes to wireless communications, Duane Stuenkel, IS manager of corporate transportation at Walgreen Co., admits there's more to it than meets the eye.

Even with heavy maintenance of Walgreen's wireless computer system outsourced to the tune of about $5,000 annually, Stuenkel wrote several customized programs and produced a summary database himself. "There's a longer learning curve in preparing for wireless solutions," Stuenkel says. "Programming applications for wireless isn't just learning one language, but many different ones."

During the past year, the Deerfield, Ill., company has implemented a wireless system that provides fleet dispatch and management to the company's 100 delivery trucks in 34 states.

The system, consisting of a computer, bar-code scanner, cellular phone, modem and portable printer aboard each delivery truck, allows corporate headquarters to locate trucks and track inventory and worker hours between distribution centers and stores.

Initial implementation cost roughly $4,000 per truck and 1½ years. "That's more time up-front than the usual programming project," Stuenkel says.

Because implementation required more muscle than Walgreen's in-house IS staff could provide, the firm chose to outsource all custom hardware development, ongoing maintenance and a big chunk of technical support.

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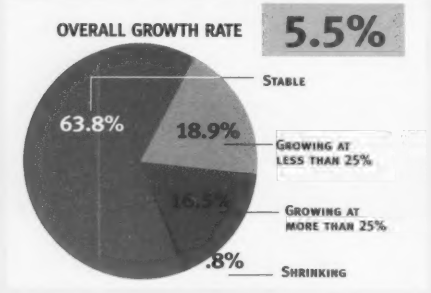
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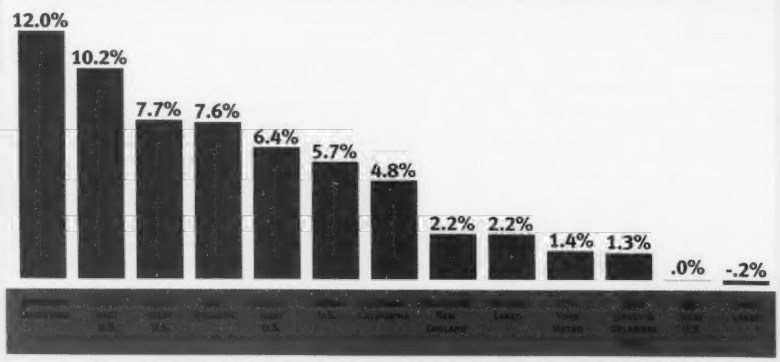


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REGIONAL GROWTH ANALYSIS



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TEXAS

The economy is enjoying some growth, but information systems professionals must hunt for pockets of opportunity

By Charles T. Clark

Healthier bottom lines are sweeping Texas, but few new technical opportunities have been created as a result.

"The economy is pretty good in this region," says Syd Limerick, manager of enterprise computing provisioning at Texas Instruments, Inc. in Dallas. But like many large firms looking to hold costs down, TI has not made hiring a priority.

In today's economy, companies are downright selective. That means only the most current skills open doors. But if you're bent on change, Austin, San Antonio and Dallas offer more fertile markets in Texas.

Austin's software industry holds particular promise, especially with a 15% increase in growth each year, reports Angelos Angelou, director of economic development at the Austin Chamber of Commerce. In addition, Advanced Micro Devices, Inc.'s new chip manufacturing facility, which will be completed early next year, is expected to add several new information systems positions.

Likewise, San Antonio's business sector is adding new jobs, according to Mario Hernandez, president of the Economic Development Foundation. But despite a strong economy, the city's largest nongovernmental employer, United Services Automobile Association, is doing little hiring, and when it does, it usually hires recent college graduates. "If we get into a skill shortage, we would go outside to hire the specific skills," says Ray Stanley, vice president of information technology planning. "It would probably be client/server or object-oriented skills."

On a much slower track, the economies of Dallas and Houston have struggled, but there are signs of recovery. "The financial industries are strong right now," says Dale Swasick, president and founder of Hall and Swasick, Inc. Telecommunications companies also offer hope.

Sabre Decision Technologies, a division of AMR Corp., is also hiring a "moderate number" of IS professionals, according to Thomas Cook, president of the division.

Bright spots even exist in Houston, although pickings are slim. Compaq Computer Corp., Baylor College of Medicine and some consulting firms are searching for a few good people. "I'm looking for programmer/analysts with payroll experience, senior network technicians, Unix systems administrators and computer operators," says Fran Chambers, director of the enterprise services group at Baylor.

Even so, recruiters caution that only the right tools will land jobs. "If you're not someone with pretty specialized skills — client/server, open systems or object-oriented technology — then it would be very hard to break in here," Stanley says. ■

Clark is a free-lance writer in Haverhill, Mass.

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Source: Computerworld's Best Places to Work survey

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A full time position is currently available for a Senior Systems Programmer within the department of Information Systems.

Job requirements include, but are not limited to the following: 5 or more years of IBM mainframe systems level programming. Experience in directing and performing installation, debugging, tuning, maintenance and configuration of systems level software. A bachelors degree in Computer Science or MIS is preferred.

For immediate consideration, qualified candidates should call or send a resume to:

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Human Resources Department
Attn: Brenan Fulkerson, 1242 North 19th Street
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If you are interested in joining an organization that is committed to its customers and rewards its consultants based upon their contributions, please fax your resume to:

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Sept. 26

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Sept. 26

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If you are unable to attend, please send your resume to: Career Fair Coordinators, P.O. Box 1458, Dept. CW, Coppell, TX 75019.

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Midwest

SENIOR SWITCH ANALYST: Responsible for switch security (providing USERIDS, PASSWORDs and PRIVCLASSES). Responsible or scheduling, application and monitoring of software "Patches". Monitor switching system preformance, if problems are identified, issue Trouble Tickets and SMWP's for corrective action to be taken by the Switch Control Center and/or switching site personnel. Schedule and monitor Vendor software and hardware systems upgrades. Review Assessment results from new system installations and make recommendations for or against to Engineering Acceptance. Make site visits to perform quality assurance and acceptance procedures. Standardize hardware and software configurations network wide as the need arises. Evaluate newly developed hardware and software features in a TEST LAB environment. Must have 4 years of experience which must include at least 3 years of experience with the Northern Telecom, Inc., DMS-250 switching system and ability to analyze Assessment results from newly installed NTI DMS switching systems. Contact: Oklahoma State Employment Service Office, 110 S. Hartford, Suite 106, Tulsa, Oklahoma 74120. Job #7207.

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Programmer/Analyst

Maurices Incorporated, a progressive, growth-oriented, nationwide retailer, offers an exciting opportunity for a Programmer/Analyst to join our MIS Department at our corporate offices in Duluth, MN.

This position will be responsible for the development of mainframe and PC systems to support retail business applications.

Qualified candidates must possess a minimum of three years mainframe programmer/analyst experience.

- **Operating Systems:** MVS/XA/ESA, MS-DOS, OS/2
- **Software** COBOL II, CICS, JCL, SAS, Windows 3.1, Gupta SQL/Win

Additional requirements include excellent verbal/written communication skills and the ability to work closely with users to analyze their requirements. Experience working with advanced tools in client/server and relational database technologies desirable.

In return for your skills and contributions, Maurices offers a competitive salary, top benefits and the opportunity to work for a growing company situated in the heart of scenic Northland living. For confidential consideration, please send a detailed resume with salary history to: **Maurices Incorporated, Attn: Tim Sworsky, 105 West Superior Street, Duluth, MN 55802**

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ATA Information Systems, one of the nation's leading providers of Electronic Funds Transfer services and related software products, is seeking an experienced Software Developer to join our Product Development Team. The individual should have experience in the following areas:

- Fortran development
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If you are a creative person who learns quickly, can deliver projects on time and enjoys working in a team environment, send or fax your resume to:

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As part of our Software Engineering Development team, you will be responsible for the design, development and implementation of APIs in an MVS/UNIX distributed computing environment. You will also be involved in the testing and evaluation of new hardware and software and will actively participate in setting the technical direction for the company.

We require excellent project management skills, as well as an understanding of C programming, UNIX internals, TCP/IP networking, multi-platform interconnectivity and systems planning and design. Experience with AIX and Oracle a plus.

For consideration, please send or fax resume with salary history to our Corporate Office: **IRI, 150 N. Clinton, Dept. AR12, Chicago, IL 60661. Fax (312) 474-2005.**

information resources

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Midwest

Client/Server Electronic Publishing

Gale Research, Inc., the leader in directory and database publishing for 40 years, has immediate opportunities for several UNIX client/server programming and electronic publishing specialists. We are migrating to a PC client, object-oriented, multi-media programming environment, supported by multiple UNIX servers. Next year, our editorial system will contain over 100 gigabytes of text and multi-media data, and support over 500 local and remote users. Our technology decisions support corporate business objectives, and are built on industry standard architectures.

All candidates must be looking for significant technical and business challenges, be able to manage critical projects simultaneously, and have superior communication skills. Management candidates must have prior experience leading teams or directing staff.

Please forward your resume and a cover letter containing a detailed description of related experiences, and salary requirements, to the address or fax number below.

Director of Electronic Development The successful candidate will possess 5-10 years of database publishing experience. The candidate must have lead the effort to bring an electronic or multi-media product to market in the past year. Strong finance and business skills are required. Will also manage outsource suppliers and services. MBA and EE or CS a plus. **Reply to position "DED".**

Director of NES Systems The successful candidate will possess 5-10 years' experience in large scale UNIX/PC system integration project management, have strong finance and business skills and broad knowledge of object-oriented programming languages, SGML data models, and SQL databases. Strong communication skills are also required. Publishing knowledge and/or an MBA is a major plus. **Reply to position "DNS".**

NES Programmers This is a combined programmer/analyst position requiring 3-6 years of advanced C++ programming with SQL database experience (Oracle, Sybase, etc.), and some Windows GUI expertise. Will work directly with users to ensure linkage between product development and database integrity. SGML and GUI experience a major plus. **Reply to position "NESP".**

Electronic Product Developers Successful candidates must have 3-6 years' experience with ISO 9660 CDROM data formats, DOS and Windows GUIs, and have used one or more commercially available CDROM authoring packages (i.e. Dataware, Fulcrum or Authorware). Will be responsible for working with editorial staff to create, program, and complete electronic and CDROM products under minimal supervision. Publishing industry, SGML or network communications experience is a major plus. **Reply to position "EPD".**

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Gale Research Inc., 835 Penobscot Building, Detroit, MI 48226. Fax: 313-961-6817.

Gale Research Inc.

HONDA

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Programmer Analysts

Honda of America Mfg., Inc. has several openings for Programmer Analysts at our Marysville, Ohio facility (approx. 30 miles NW of Columbus). The selected candidates will work in a large IBM environment to support the automobile, motorcycle, and engine manufacturing operations; and interact with all levels of users in the definition, development, and implementation of projects.

The ideal candidates should possess a minimum of 2-3 years of experience with the following:

MVS/ESA	CICS
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Honda offers an excellent compensation and benefits package including relocation allowances. Additional career enhancements are also available. For confidential consideration, submit your resume to: **Attn: JKPD994; Honda of America Mfg., Inc.; 24000 Honda Parkway; Marysville, OH 43040-9251.**

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Software Sales and Marketing Manager for Software Development firm. Duties include: new customer development; conduct system studies at customer locations in CAD-CAM-CAE and MIS (Management Information System). Provide customer with proposed business plan for personnel and cost including areas of computer aided design analysis, optimization and manufacturing, plant and process flow design optimization, piping stress analysis, drafting and detailing, PCB (Printed Circuit Board), VLSI (Very Large Scale Integrated Circuit), and hardware design and manufacturing, architectural design and structural design analysis, geographic information system, multi-media and management information system. Requires a Bachelor's degree in Marketing, Business, Computer Science or Systems Engineer. Requires two years experience in the job offered or two years experience in Software Sales and Marketing including experience with on-site consulting of system analysis and design utilizing CAD-CAM-CAE solutions. Salary is $80,000.00 per year. Hours are 8:00 am to 5:00 pm, forty per week. Send resume to 7310 Woodward, Room 415, Detroit, MI 48202. Ref. #102694. Employer paid ad.

Research Associate (Computer Programmer II Engineering & Scientific), 40hrs/wk, 8-5, $31,968/12mos yr. Provide project management of molecular sequence databases & neural network tools for human genome research. Responsible for UNIX system administration & TCP/IP, E-mail server, ftp file server, network administration & user support. Integrate existing neural network tools written in C & FORTRAN. Develop new software tools & design user interface using C & X Window Motif for neural network system . Min reqs: Masters in Computer Science. 2 yrs in carrying out those duties set forth in the job offered or 2 yrs in C programming, UNIX system administration, TCP/IP, network administration & SQL database management. 3 college credit hrs in a course covering FORTRAN programming & 3 college credit hrs in computer system performance. Apply at the Texas Employment Commission, Tyler, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O.#TX7212010. Ad Paid by an Equal Employment Opportunity Employer.

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October 3 - 2 pm - 8 pm Guest Quarters Suites Hotel, Troy
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College degree/minimum 2 years' experience preferred. DP -all software languages/hardware platforms/operating systems; Engineering – all disciplines. For more information call 313.882.2277 or if you are unable to attend, fax your resume to Molly McCarthy, hl communications, inc., 313.882.3626.

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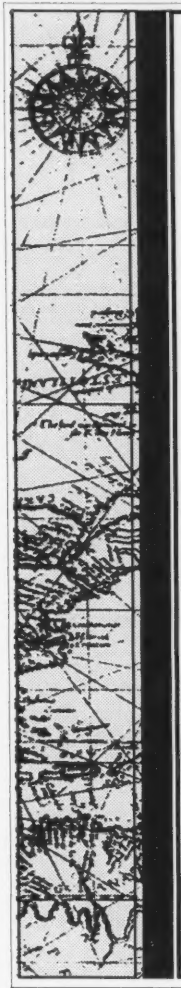
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Career Opportunities

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Account Manager

Responsibilities will include providing our clients with software implementation, project management and issue resolution.

Ideal candidate will have project management & implementation experience, as well as a strong understanding of implementation methodology and customer satisfaction. Experience using project management tools and exceptional verbal and written communication skills a must. This position requires the ability and flexibility to travel and eight to ten years of related experience.

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We are seeking Software Consultants for each of the following: Materials Management, Human Resources and Finance. Responsibilities will include providing end-user classroom training and consulting services utilizing Lawson's products. Requirements include a bachelor's degree in a related field along with public speaking skills. Two to four years computerized business application systems experience on UNIX, AS400 and/or implementation skills an added plus. Excellent communication, interpersonal and problem-solving skills necessary. Overnight travel required.

UNIX Technical Service Consultant

Responsibilities include product installations, technical training and operational usage consulting to our diverse client base. Requirements include at least two to three years UNIX operating system administration experience along with installations and/or implementation background. Excellent communication, interpersonal, verbal and presentation skills essential. Experience with consulting/training a plus. Knowledge of Sybase or Oracle databases preferred. Overnight/out-of-town travel required.

We offer a competitive salary, comprehensive benefits and an opportunity to work in a quality-focused team environment. Please submit resumes (specifying position for which you are applying), which must include salary requirements, to: **Karen Ojeda, Sr. Human Resources Generalist, 1300 Godward Street, Minneapolis, MN 55413.** EOE.

LAWSON *Software*

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FIRST DATA CORPORATION (FDC) is a NYSE listed provider of high quality, high-volume information processing services to the bankcard, payment instruments, teleservices, mutual fund, health care, cable television, receivable and information management industries. Our 1993 revenues grew by 24% exceeding $1.5 billion and a net income increase of 22% to over $173 million.

First Data Card Services Group is headquartered in **Omaha, Nebraska** featuring a life style "2nd to none" and a cost of living index that is 7% lower than the US average. Omaha has 9 institutions of higher learning, cultural facilities for Dance, Music and Theater, 7000 acres of parks, 26 public golf courses, over 200 public tennis courts and 8 state parks within a 50 mile radius of the city. We are America's leading credit card transaction processor delivering high-quality services to more than 700 financial institutions...1 million merchants...and nearly 70 million cardholders around the world.

Immediate opportunities exist in Omaha, our new St. Louis Data Center as well as Data Centers in other major US cities. All our facilities feature a casual dress work environment. We seek **Systems and Programming** professionals with Bankcard or Financial systems background and technical expertise for the following positions:

- **PROGRAMMERS/ANALYSTS over 2 years experience in a large scale mainframe environment with COBOL/COBOL II and/or ASSEMBLER, JCL and VSAM. Other positions available require knowledge of CICS and/or DB2/ORACLE, UNIX, TCP/IP, C or C++, Microsoft WINDOWS NT.**
- **TEST TEAM MEMBERS with JCL work experience, and solid understanding of COBOL, and IBM utilities (IEBGENR, IEBCOPY etc.). CA-7, CA-11, and Operational background desired. Requires proactive approach and intelligent risk taking.**
- **CICS SYSTEM PROGRAMMERS with CICS on-line systems installation and maintenance experience.**
- **PROGRAMMER ANALYSTS with knowledge of COBOL, BAL, VSAM, OS/JCL, CICS and ROSCOE. CA-7 and DB2 knowledge a plus. You must be able to work multiple projects simultaneously and prioritize workload as needed. A minimum 2 years Software Development experience and an Associate's degree in Computer Science or equivalent required.**
- **DATABASE ANALYSTS with a minimum 5 years experience in large mainframe environments (SYBASE, ORACLE, or DB2) as DATABASE ANALYSTS. Background in Bankcard or Financial Systems Applications is a plus.**
- **DATA ANALYSTS with a minimum 3 years experience in Relational Database development and design, as well as excellent data modeling, analysis and communication skills. You will provide expertise and support to application development teams in the analysis and design of subject-area databases. Client/Server and Distributed Processing background helpful.**
- **PC PROGRAMMERS with a minimum 3-5 years experience using C, C++, WINDOWS NT, SYBASE and ORACLE in a development environment.**

FDC offers a competitive salary structure and outstanding benefits featuring Life/Medical Insurance, Dental, Vision, Legal, 401(k), Retirement, Stock Purchase Plans, Tuition Reimbursement, Career Guidance, Relocation and more. **Qualified candidates may send or FAX (402-222-6464) resume indicating position of interest to: Wade L. Haught - Manager Technical Recruiting**

First Data Card Services Group
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NETWORK OUTSOURCING: Second time's a charm

By Joanne Cummings

When it comes to network outsourcing, users say, the second time's a charm. But watch that first step; it can be a doozy.

Take Butler Service Group, a recruiting firm in Montvale, N.J., for example. When it moved from a Wang Laboratories, Inc. VS 100 with dial-up connections to an IBM AS/400-based dedicated network linking more than 50 remote sites, it decided to outsource the new network. "I didn't have the personnel, the time or the [money] to call up AT&T or whomever and say, 'I want a line from here to here,'" says Alethea Pratt, vice president of management. "I didn't want to be responsible for any of that stuff. That's not what I want to do with my life."

Butler's current outsourcer, Memphis-based Cylix Communications Corp., handles everything from line maintenance and troubleshooting to performance reporting. "It has worked out very nicely the second time around," she says. "I had some problems with [my first] carrier, which shall remain nameless."

With its first choice, Butler had problems with lines going down, unresolved trouble tickets and poor problem-reporting. "They didn't know what the problems were," she says. After dumping them, Pratt says her firm was much savvier in selecting vendor No. 2.

Pratt suggests verifying the outsourcer's expertise. "Make sure [they're] adept in data lines," she says. "Just because they're in voice doesn't mean they know what they're doing in data."

The contract should also spell out the required network uptime. "If you're going to be savvy, negotiate a clause that requires the outsourcer to have a certain percentage of uptime," Pratt says. "And if they're not up for that period of time, penalties should be involved."

Richard Bowman, director of global operations at Citicorp Dealing Resources, Inc., a New York-based financial trading services firm, agrees. "You must decide whether you need 30-second notification of an outage and make sure that's spelled out."

Citicorp Dealing, which outsources its entire 1,000-site global financial trading network, is also on its second outsourcer, Digital Equipment Corp. The first didn't work out. "Let's just say our idea of network monitoring was different from theirs," he says. "They didn't understand the spirit of the contract and didn't meet the letter."

When shopping around for a vendor, Bowman warns against assigning the job to a network staffer.

"I don't recommend [putting] the guy who's run the network for the past 20 years in charge," Bowman says. "He's not an expert in forming contracts or managing vendor staff." Instead, find a consultant who's been through the process. "If your risk of failure is great, and it usually is, doing it completely in-house is probably not the best way."

The way to go

It's also important to have some control over the outsourcer's staff. "You must meet the senior people in the organization and make sure their heads and hearts are in the right place," Bowman says. "Also, be sure you get first refusal for any promotion or replacement of [your] primary contact."

Although both Pratt and Bowman were burned the first time, neither would reconsider their decision. Bowman says he likes leveraging the outsourcer's staffing expertise. "We're in about 15 different countries, and it's hard to keep on top of the different issues with each [Post Telephone & Telegraph administration]. I would need a number of people on staff to handle something like that, and that would be expensive."

"I definitely recommend [outsourcing] to anybody who's struggling to do this. Nobody's chasing after line problems," Pratt adds. "If a line goes down, they route the thing around and the dial backup comes back up again, and I don't even know it." ■

Cummings is a free-lance writer in Marlboro, Mass.

OUTSOURCED RESOURCES

(Percentage of companies outsourcing or considering it)

	Summer 1991	Winter 1993
Mainframes	12.3%	14.2%
Midrange	3.7%	6.2%
PCs	7.7%	7.7%
Data networks	8%	8.5%
Application development	0%	15%
Other	1.8%	9.6%

Multiple responses allowed; Base: 1,200 respondents

Source: The Outsourcing Institute, New York

DON'T FORGET

Plan for growth.
"You have to make sure that you get a contract that will allow you to move up the line," says Alethea Pratt, vice president of management at Butler Service Group. "So if you start out at 9.6K, you can move up to 56K and 19.2K and so on without any pain."

Seriously consider dial backup.
"Just don't assume that the lines will be there all the time," Pratt says.

Match personalities.
"You wouldn't hire an employee you didn't like, so why should you be forced to work with one at your outsourcer?" says Richard Bowman, director of global operations at Citicorp Dealing Resources.

Avoid overmanaging.
"You're paying an outsourcer a lot of money to do things, so don't try to manage that outsourcer as if he were on your own staff," Bowman says. "Manage by exception. Identify what's critical and then set thresholds. Once the threshold is exceeded, that's when you step in."

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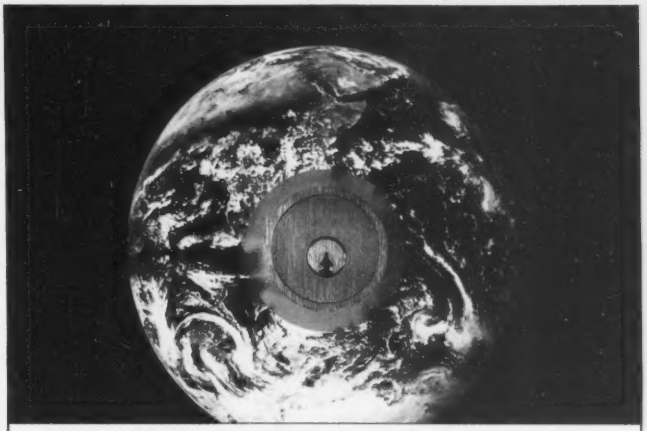
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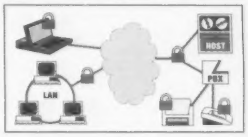
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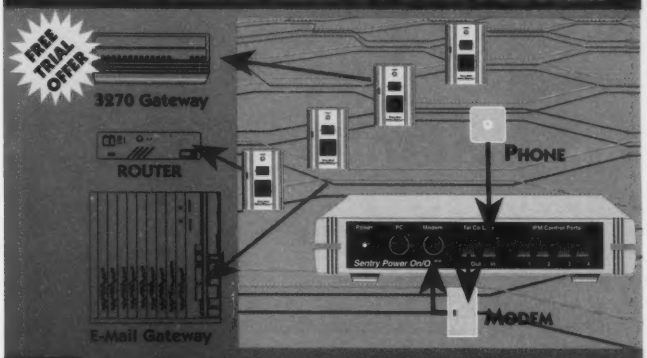
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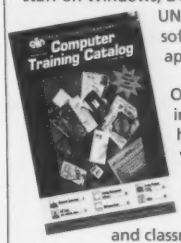
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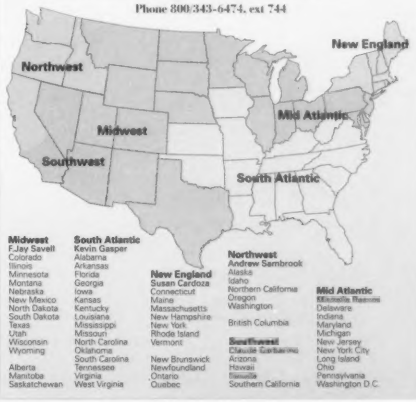
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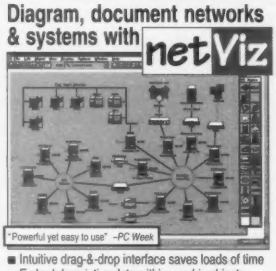
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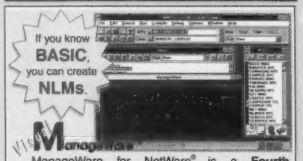
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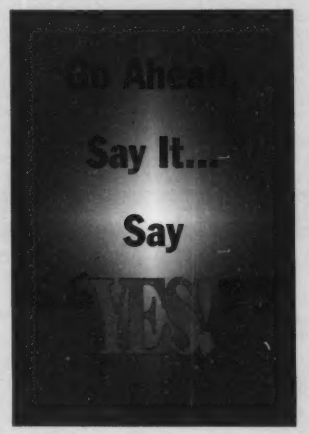
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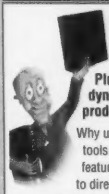
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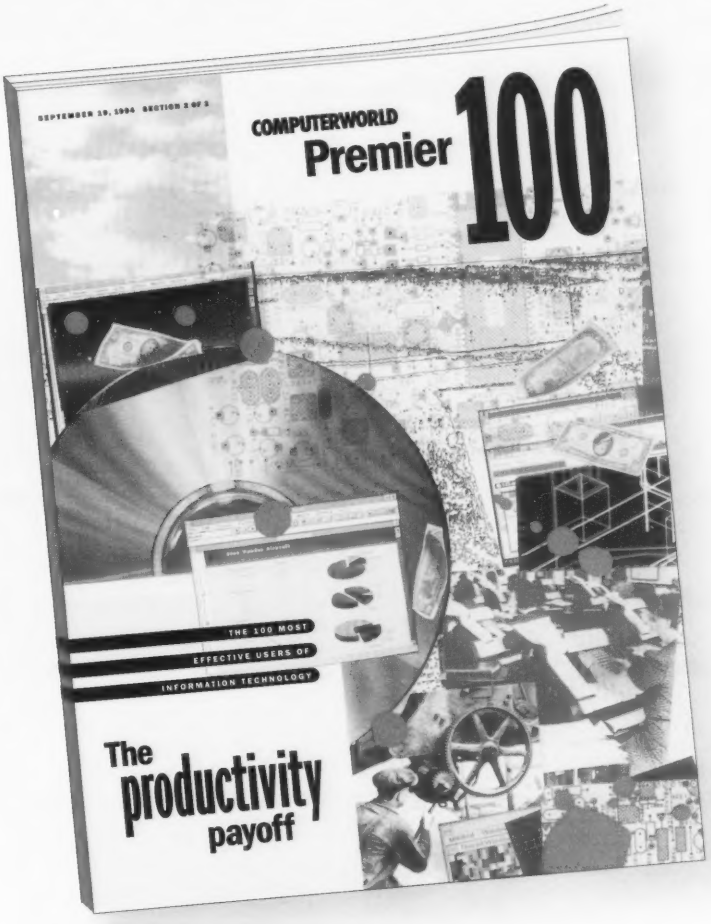
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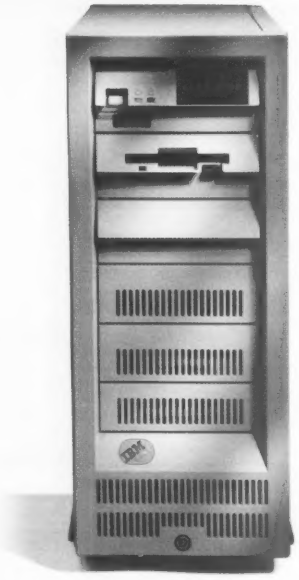
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"The IBM PS/2 Server 95 Array belongs on every system manager's short list."

Julian Evans
PC Magazine™
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December '93



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IBM

Sept. 16 Stock Ticker

Gainers

Percent

MathSoft	50.0
CompUSA Inc.	36.1
Data Race Inc.	29.7
Merisel	21.4
Symantec Corp.	21.2
NetManage Inc.	19.4
Microage Inc.	19.2
Intelligent Info. Systems	18.8

Dollar

Stratacom Inc.	4.75
Adobe Systems Inc.	4.63
Compuware Corp.	4.56
Chipcom Corp.	4.50
General Datacomm Inds.(H)	4.50
IMRS	4.50
Parametric Technology	4.19
Integrated Silicon Systems	3.88

Losers

Percent

Struct. Dynamics Research	-39.5
Cray Computer	-19.2
Walker Interactive Systems	-18.8
State of the Art	-11.1
Hogan Systems Inc.	-10.2
IPL Systems Inc.	-9.7
System Software Assoc.	-8.6
Cambex Corp.	-8.3

Dollar

Struct. Dynamics Research	-3.06
Intuit Inc.	-2.88
Wall Data Inc.	-2.75
Walker Interactive Systems	-1.63
Octel Communications Corp.	-1.25
System Software Assoc.	-1.25
Sybase Inc.	-1.13
Cirrus Logic	-1.00

Technology shares as a whole rose last week, while General DataComm reached a new high for the fifth week in a row. Intuit, Inc.'s shares dropped after it reported a quarterly loss.

Reprinted from Computerworld

If you stock it, will they come?

One sector of technology stocks that might gain from the burgeoning PC market [CW, Sept. 12] is the retail chains that have been struggling, in some cases, to sell the hardware and software products to consumers.

According to Clifford Haigler, an analyst at SouthCoast Capital Corp. in Austin, Texas, the primary issue facing the largest computer retailer, **CompUSA, Inc. (CPU)**, is that the price of Intel Corp. Pentium-based computers is too high and users do not want to buy I486s. "If the price comes down enough, you'll see more demand," he said. But right now, "investors are very skittish on CompUSA."

Additionally, while rivals Best Buy and Circuit City also sell audio and video electronics, CompUSA is strictly a computer retailer. "They are leveraged to the computer cycle more than anyone else," Haigler said.

Meanwhile, an optimistic Thomas Carley at Jensen Securities in Portland, Ore., rates once-troubled software seller **Egghead, Inc. (EGGS)** a Buy based on its retail success during the last three quarters, new management, a strong balance sheet and a new retail format. "The combination of the leverage generated by being one of the largest domestic resellers of software, cost-cutting efforts to improve profitability and a talented new executive team has enhanced Egghead's growth potential," he said.

Last month, two other software retailers, **Babbages, Inc. (BBGS)** and **Software Etc. Stores, Inc. (SFWR)** announced plans to merge. Even so, Keith Benjamin of Robertson, Stephens & Co. in San Francisco considers the shares attractive only for long-term investments. They have short-term risk because of the uncertainty in the 16-bit software market, he said.

— Tim Ouellette

Retail computer suppliers

CompUSA shares have increased steadily in the past weeks, while Egghead is poised for gains, trading 22% below book value

Company	Ticker	Sept. 2	Sept. 9	Sept. 16
Babbages	BBGS	11 7/8	13 3/4	12
CompUSA	CPU	8 1/4	9	12 5/8
Egghead	EGGS	7	7 3/4	6 1/8
Elek-Tek	ELEK	9	9 1/2	10
Software Etc.	SFWR	9 1/4	9	8 1/4

Exch	52-Week Range			Sept.16 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						**UP 3.66%**
OTC	36.38	13.50	3 COM Corp.	36.38	3.19	9.6
NYS	44.88	36.25	AMERITECH Corp.	41.75	0.88	2.1
NYS	61.38	49.50	AT&T	55.00	1.00	1.9
OTC	26.50	12.75	Banyan Systems Inc.	16.75	0.19	1.1
NYS	69.13	49.00	Bell Atlantic Corp.	53.75	1.00	1.9
NYS	63.88	53.00	Bellsouth Corp.	57.38	0.13	0.2
NYS	21.50	8.38	Bolt, Beranek & Newman	18.63	2.13	12.9
OTC	15.75	9.00	Brooktrout Technology	11.00	0.50	4.8
NYS	53.00	33.06	Cabletron Systems (s)	47.38	3.77	8.7
OTC	43.00	10.00	Centigram Communications	16.50	2.13	14.8
OTC	60.25	31.50	Chipcom Corp.	57.50	4.50	8.5
OTC	40.75	18.75	Cisco Systems Inc.	26.00	0.69	2.7
OTC	18.38	9.25	Compression Labs Inc.	10.50	-0.88	-7.7
OTC	12.38	5.13	Computer Network Tech.	7.75	0.38	5.1
OTC	33.75	8.50	CrossComm	10.25	1.06	11.6
OTC	3.00	1.50	Data Switch Corp.	2.38	-0.06	-2.6
OTC	36.56	17.88	DSC Communications	30.63	1.88	6.5
NYS	28.75	8.25	General Datacomm Inds. (H)	28.75	4.50	18.6
NYS	39.88	29.50	GTE Corp.	30.50	-0.13	-0.4
NYS	95.97	78.63	ITT Corp.	81.63	1.00	1.1
OTC	29.63	21.38	MCI Communications Corp.	24.38	0.75	3.2
OTC	8.25	2.38	Microcom Inc.	7.88	0.44	5.9
OTC	23.50	11.25	NetManage Inc.	21.50	3.50	19.4
OTC	7.25	4.00	Netrix Corp.	4.88	-0.25	-4.9
OTC	8.75	3.38	Network Computing Devices (L)	3.88	0.38	10.7
NYS	14.88	7.38	Network Equipment Tech. (H)	14.25	0.25	1.8
OTC	23.38	11.88	Network General	19.44	-0.38	-1.9
OTC	9.63	6.38	Network Systems Corp.	8.63	0.00	0.0
OTC	72.25	26.50	Newbridge Networks Corp.	31.88	0.00	0.0
NYS	36.88	23.75	Northern Telecom Ltd.	36.88	2.00	5.7
OTC	26.63	13.38	Novell Inc.	15.50	-0.50	-3.1
NYS	48.50	33.25	Nynex Corp.	37.75	0.38	1.0
OTC	30.00	15.50	Octel Communications Corp.	22.00	-1.25	-5.4
OTC	18.75	9.00	Optical Data Systems Inc.	18.75	0.50	2.7
OTC	7.50	3.13	Penril Data Comm Networks	3.75	0.13	3.4
OTC	20.75	10.00	Picturetel Corp.	17.50	1.38	8.5
OTC	8.25	2.13	Proteon Inc.	4.13	0.00	0.0
OTC	14.38	2.75	Racotek Inc.	4.13	-0.25	-5.7
NYS	45.00	24.88	Scientific Atlanta Inc.	44.25	0.50	1.1
NYS	45.25	36.75	Southwestern Bell Corp.	41.50	0.38	0.9
NYS	40.25	31.38	Sprint Corp.	39.38	1.38	3.6
OTC	26.75	13.38	Standard Microsystems Corp.	21.75	1.88	9.4
OTC	43.50	12.13	Stratacom Inc.	43.50	4.75	12.3
OTC	33.75	13.13	Synoptics Communications	15.75	-0.19	-1.2
OTC	15.25	3.88	Telebit Corp.	5.22	0.09	1.8
OTC	46.00	23.00	US Robotics	35.63	1.75	5.2
NYS	50.75	38.25	US West Inc.	39.50	-0.25	-0.6
OTC	43.88	18.75	Wellfleet Communications	22.13	-0.50	-2.2
OTC	28.25	12.75	Xircom	19.50	-0.25	-1.3
OTC	23.75	13.25	Xylogics Inc.	23.75	2.00	9.2
OTC	29.25	11.25	Xyplex Inc.	27.75	0.13	0.5
PCs and Workstations						**UP 3.44%**
OTC	7.50	2.63	Advanced Logic Research	4.13	-0.13	-2.9
OTC	38.50	22.00	Apple Computer Inc.	36.88	1.13	3.1
OTC	33.00	14.00	AST Research Inc.	14.00	-0.06	-0.4
NYS	39.88	18.41	Compaq Computer Corp.	37.63	1.75	4.9
OTC	37.50	15.13	Dell Computer Corp.	37.50	3.81	11.3
OTC	25.00	9.25	Gateway 2000 Inc.	17.13	1.81	11.8
NYS	93.63	64.38	Hewlett Packard Co.	91.00	1.50	1.7
NYS	26.88	18.75	Silicon Graphics	24.63	-0.13	-0.5
OTC	31.38	18.25	Sun Microsystems Inc.	28.13	1.38	5.1
NYS	50.75	30.75	Tandy Corp.	42.75	-0.25	-0.6
NYS	5.13	2.38	Zeos International Ltd.	3.00	0.13	4.3
Large Systems						**UP 3.79%**
ASE	10.25	4.38	Amdahl Corp.	9.25	0.00	0.0
NYS	8.75	4.25	Convex Computer (H)	8.25	0.75	10.0
OTC	4.50	0.50	Cray Computer	1.31	-0.31	-19.2
NYS	33.75	19.13	Cray Research Inc.	21.00	-0.25	-1.2
NYS	10.75	6.63	Data General Corp.	9.88	0.88	9.7
NYS	39.13	18.25	Digital Equipment Corp.	24.88	0.75	3.1
OTC	6.38	2.38	Encore Computer Corp.	4.00	0.00	0.0
NYS	52.25	40.38	Harris Corp.	48.63	1.00	2.1
NYS	71.38	41.25	IBM	71.38	3.75	5.5
OTC	18.75	7.75	NetFrame	11.00	1.25	12.8
OTC	26.00	3.88	Parallan Computer	4.50	0.13	2.9
OTC	22.00	5.38	Pyramid Technology	8.88	1.38	18.3
OTC	20.00	11.13	Sequent Computer Sys.	17.50	-0.13	-0.7
OTC	6.84	2.25	Sequoia Systems Inc.	5.00	0.41	8.8
NYS	38.63	22.88	Stratus Computer Inc.	37.88	0.25	0.7
NYS	16.38	10.00	Tandem Computers Inc.	15.50	0.88	6.0
NYS	30.00	3.88	TriCord Systems	5.38	-0.13	-2.3
NYS	16.50	8.63	Unisys Corp.	10.75	1.13	11.7
Software						**UP 1.87%**
OTC	34.88	16.50	Adobe Systems Inc.	34.88	4.63	15.3
OTC	8.13	4.38	American Software Inc.	4.88	0.25	5.4
OTC	15.75	6.75	Ask Computer Systems	13.03	0.03	0.2
OTC	66.00	37.00	Autodesk Inc.	61.75	0.50	0.8
OTC	3.88	1.75	Bachman Info. Systems	2.25	0.00	0.0
OTC	28.25	20.50	BGS Systems Inc.	24.13	-0.63	-2.5
OTC	71.00	40.50	BMC Software Inc.	45.50	1.88	4.3
OTC	30.75	22.50	Boole & Babbage	29.75	1.50	5.3
OTC	18.25	8.50	Borland Int'l. Inc.	12.31	-0.19	-1.5
OTC	25.00	6.75	Brock Control Systems Inc.	10.00	-0.25	-2.4
OTC	4.63	2.38	CE Software	2.75	0.00	0.0
ASE	30.34	6.25	Cheyenne Software Inc.	11.50	-0.50	-4.2
OTC	14.25	7.38	Cognos Inc.	12.25	0.13	1.0
NYS	44.88	27.38	Computer Associates	42.25	1.88	4.6
NYS	5.38	2.13	Computervision Corp.	2.63	0.13	5.0
OTC	48.25	21.00	Compuware Corp.	44.81	4.56	11.3
OTC	14.00	8.75	Comshare Inc.	12.50	0.00	0.0
OTC	25.00	14.88	Corel Corp.	19.88	2.88	16.9
OTC	7.13	2.88	Easel Corp.	4.44	0.56	14.5
OTC	29.25	13.00	Filenet Corp.	23.00	-0.25	-1.1
OTC	25.00	3.00	4th Dimension	6.25	0.75	13.6
OTC	15.00	7.25	Frame Technology (H)	15.00	0.75	5.3
OTC	11.00	7.00	Group I Software	8.00	0.00	0.0
OTC	31.75	6.75	Gupta	10.00	0.00	0.0
OTC	12.00	5.88	Hogan Systems Inc.	6.63	-0.75	-10.2
OTC	36.25	17.00	IMRS	36.25	4.50	14.2
OTC	43.13	11.50	Information Resources	13.38	-0.25	-1.8
OTC	24.50	14.25	Informix Corp.	23.25	1.13	5.1
OTC	11.25	8.75	Intergraph Corp.	9.44	0.19	2.0
OTC	8.75	2.50	Interleaf Inc.	4.75	0.38	8.6
OTC	15.50	7.50	Intersolv Inc.	13.00	0.00	0.0
OTC	50.00	27.00	Intuit Inc.	40.13	-2.88	-6.7
OTC	18.75	2.25	Knowledgeware Inc.	3.75	0.06	1.7
OTC	34.75	17.50	Legent Corp.	24.25	0.75	3.2
OTC	86.50	29.75	Lotus Development	42.88	-0.25	-0.6
OTC	18.00	6.00	Magic Software Enterprises	10.38	0.38	3.8
OTC	18.50	6.00	Manugistics Group Inc.	8.75	-0.50	-5.4
OTC	7.50	1.44	MathSoft	3.00	1.00	50.0
OTC	11.25	4.50	McAfee Associates	8.38	-0.38	-4.3
OTC	17.25	9.38	Mentor Graphics	10.38	0.50	5.1
OTC	27.38	11.50	Micro Focus	13.00	0.13	1.0
OTC	11.63	4.63	Micrografx Inc.	5.75	-0.13	-2.1
OTC	59.25	37.38	Microsoft Corp.	57.06	0.06	0.1
OTC	44.38	26.19	Oracle Corp.	44.13	1.25	2.9
OTC	44.75	21.50	Parametric Technology	30.75	4.19	15.8
OTC	24.50	13.38	ParcPlace Systems Inc.	21.00	-0.56	-2.6
OTC	48.25	26.00	Peoplesoft	42.63	-0.50	-1.2
OTC	6.25	3.50	Phoenix Technologies	5.50	0.00	0.0
OTC	69.50	26.25	Powersoft	44.50	-0.25	-0.6
OTC	39.75	3.50	Platinum Software	6.50	0.00	0.0
OTC	18.63	7.25	Platinum Technology (H)	18.63	1.63	9.6
OTC	60.25	27.00	Progress Software Corp.	33.63	1.38	4.3
OTC	4.13	1.94	Quarterdeck Office Sys.	2.50	0.00	0.0
OTC	26.75	9.50	Rainbow Technologies Inc.	12.50	-0.25	-2.0
OTC	10.50	3.38	Rasterops	3.75	-0.13	-3.2
OTC	14.50	2.88	Ross Systems	3.63	-0.13	-3.3
OTC	28.63	2.75	Sapiens Intl. Corp. N.V.	4.88	-0.13	-2.5
OTC	14.63	9.75	Softkey International Inc.	14.00	0.75	5.7
OTC	8.63	3.00	Software Publishing Corp.	4.75	0.00	0.0
OTC	11.00	5.00	State of the Art	6.00	-0.75	-11.1
NYS	35.63	21.88	Sterling Software Inc.	31.38	0.25	0.8
OTC	19.88	4.69	Struct. Dynamics Research	4.69	-3.06	-39.5
OTC	57.00	27.38	Sybase Inc.	48.13	-1.13	-2.3
OTC	20.50	9.88	Symantec Corp.	15.75	2.75	21.2
OTC	52.75	33.00	SynOpsys	47.25	3.75	8.6
OTC	18.00	11.75	System Software Assoc.	13.25	-1.25	-8.6
OTC	6.75	3.25	Trinzic Corp.	3.63	0.00	0.0
OTC	30.00	11.75	ViewLogic Systems	19.75	1.25	6.8
OTC	23.25	12.00	VMark Software Inc.	20.25	1.00	5.2
OTC	13.25	6.00	Walker Interactive Systems	7.00	-1.63	-18.8
OTC	60.00	29.50	Wall Data Inc.	31.75	-2.75	-8.0
Semiconductors						**UP 2.34%**
NYS	31.75	16.75	Advanced Micro Devices	29.50	1.63	5.8
NYS	33.88	19.38	Analog Devices Inc.	31.75	0.88	2.8
OTC	30.38	10.94	Atmel Corp.	30.25	1.00	3.4
OTC	7.50	3.63	Chips and Technologies	4.50	0.38	9.1
OTC	44.63	24.88	Cirrus Logic	29.63	-1.00	-3.3
NYS	20.00	11.25	Cypress Semiconductor Corp.	20.00	0.75	3.9
NYS	20.13	13.00	Dallas Semiconductor	15.25	-0.50	-3.2
OTC	28.00	14.75	Integrated Silicon Systems	28.00	3.88	16.1
OTC	74.50	55.88	Intel Corp.	66.75	1.13	1.7
NYS	35.13	13.00	LSI Logic Corp.	35.13	3.75	12.0
OTC	26.75	12.25	Lattice Semiconductor	19.50	0.13	0.6
NYS	44.88	15.16	Micron Technology	42.00	2.25	5.7
NYS	55.75	42.13	Motorola Inc.	54.25	1.75	3.3
NYS	25.00	14.38	National Semiconductor	16.50	-0.75	-4.3
OTC	14.25	6.75	Sierra Semiconductor (H)	13.38	-0.50	-3.6
NYS	89.50	55.75	Texas Instruments	77.88	2.00	2.6
OTC	18.88	9.38	VLSI Technology	11.50	-0.75	-6.1
OTC	14.38	2.88	Weitek	3.13	-0.06	-2.0
ASE	20.38	4.63	Western Digital Corp.	16.00	1.25	8.5
OTC	59.75	29.00	Xilinx	50.00	1.25	2.6
OTC	40.75	26.50	Zilog Inc.	33.50	0.63	1.9
Peripherals and Subsystems						**UP 2.96%**
OTC	30.50	14.50	American Power Conversion	19.75	1.25	6.8
OTC	26.25	18.75	Banctec Inc. (H)	26.25	0.25	1.0
OTC	7.75	3.25	Cambex Corp.	4.13	-0.38	-8.3
ASE	7.38	1.88	Cognitronics Corp.	2.38	0.00	0.0
NYS	20.50	9.00	Conner Peripherals	11.13	-0.38	-3.3
OTC	24.00	9.38	Creative Technologies Inc.	18.72	-0.03	-0.2
OTC	14.00	3.50	Data Race Inc.	6.00	1.38	29.7
ASE	10.75	4.13	Dataram Corp.	5.13	-0.38	-6.8
NYS	23.00	12.38	EMC Corp.	19.25	2.00	11.6
OTC	9.88	3.13	Emulex Corp. (H)	9.50	0.13	1.3
OTC	21.00	11.75	Evans & Sutherland	12.50	-0.25	-2.0
OTC	22.50	8.75	Exabyte	18.50	-0.25	-1.3
OTC	28.50	2.63	Intelligent Info. Systems	4.75	0.75	18.8
OTC	4.38	2.00	Iomega Corp.	3.44	0.31	10.0
OTC	9.75	3.00	IPL Systems Inc.	3.50	-0.38	-9.7
OTC	25.00	7.50	Komag Inc.	25.00	1.88	8.1
OTC	8.63	4.25	Maxtor Corp.	5.13	0.25	5.1
OTC	8.75	6.88	Micropolis Corp.	7.13	0.50	7.5
OTC	22.50	10.25	Pinnacle Micro Inc.	13.25	0.13	1.0
OTC	20.25	6.50	Printronix Inc.	18.75	1.75	10.3
NYS	11.75	6.88	QMS Inc.	9.88	0.00	0.0
OTC	20.25	9.38	Quantum Corp.	16.38	0.63	4.0
OTC	10.00	3.63	Radius Inc.	10.00	0.00	0.0
NYS	17.75	6.75	Recognition International	6.88	-0.25	-3.5
NYS	6.88	3.63	Rexon Inc.	4.75	0.25	5.0
OTC	28.75	16.25	Seagate Technology	24.75	0.25	1.0
NYS	41.50	23.75	Storage Technology	34.88	0.13	0.4
NYS	37.88	21.38	Tektronix Inc. (H)	37.88	3.50	10.2
NYS	109.38	69.88	Xerox Corp.	105.13	-0.88	-0.8
Services						**UP 4.66%**
OTC	27.25	16.50	American Mgmt. Systems	25.38	1.63	6.8
NYS	4.25	2.50	Anacomp Inc.	2.88	0.06	0.0
OTC	23.50	14.50	Analysts Int'l	14.75	0.00	0.0
NYS	56.88	47.63	Auto Data Processing	56.13	2.38	4.4
OTC	18.25	11.50	Cambridge Tech. Partners	15.63	-0.13	-0.8
NYS	27.50	17.00	Ceridian Corp.	26.63	0.13	0.5
NYS	24.25	15.75	Comdisco Inc.	21.50	-0.25	-1.1
OTC	12.50	6.50	Computer Horizons	11.13	0.25	2.3
NYS	45.25	29.38	Computer Sciences	43.25	-0.88	-2.0
NYS	10.38	6.38	Computer Task Group	9.75	0.00	0.0
NYS	31.25	6.75	CompUSA Inc.	12.25	3.25	36.1
OTC	12.75	6.38	Control Data Systems Inc.	7.25	0.00	0.0
OTC	11.00	6.13	Egghead Discount Software	7.13	-0.13	-1.7
NYS	38.00	26.50	General Motors E (EDS)	38.00	1.13	3.1
OTC	21.00	7.25	Inacom Corp.	9.00	-0.63	-6.5
OTC	28.00	13.63	Intelligent Electronics	17.75	2.13	13.6
OTC	22.50	7.00	Merisel	10.63	1.88	21.4
OTC	32.50	9.25	Microage Inc.	15.50	2.50	19.2
OTC	40.50	28.50	Paychex	32.75	-0.75	-2.2
NYS	39.88	22.25	Policy Management Sys.	39.88	1.50	3.9
NYS	28.25	18.63	Reynolds and Reynolds	25.63	-0.13	-0.5
OTC	28.50	17.00	SEI Corp.	22.25	0.25	1.1
OTC	29.38	20.88	Shared Medical Systems	27.75	2.25	8.8
OTC	11.00	4.88	SHL Systemhouse	5.44	0.39	7.7
OTC	25.50	9.25	Software Spectrum Inc.	13.63	0.88	6.9
OTC	42.75	31.50	Sungard Data Systems	34.00	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Users await price relief

CONTINUED FROM COVER 1

sures is their new willingness to sign pure per-user contracts, which can give customers more leeway than traditional price structures based on hardware size and model.

The Vancouver Stock Exchange, for example, has been talking with Sybase and Oracle for over a year about a $10 million information systems overhaul planned for 1995. "Oracle wants to give us a 30% to 40% discount off list, [while] Sybase says it's prepared to get real aggressive, too," said Jim Kent, the exchange's manager of technology planning.

Among the immediate threats is CA's sharp slash in Ingres pricing two weeks ago, which promised discounts of 50% to 80% off previous prices. Plus, Microsoft has renewed threats to make its SQL Server database, which now lists for $995 to $19,995, less expensive than ever — an estimated $150 per user — when the SQL 95 upgrade ships next year.

Feature fusion

Further pushing the database makers is commoditization. Their core engines are looking more and more similar, said W. Leland Hill, director of information technology at GT Global, a San Francisco financial firm. All the major providers sport standard functions, such as two-phase commit, uniform SQL and LAN and WAN support.

"It used to be that you couldn't get all that stuff from every vendor, so your choice was often made for you, depending on the features you needed," Hill said. "Price was almost secondary."

But no longer. These issues have made price the deciding factor for many new database users, said Becky Henderson, senior database administrator at The Associated Group, a finance and insurance conglomerate in Indianapolis.

For example, Henderson could not persuade upper management to buy Sybase products until the vendor came back with an offer that was less than half of what Associated had budgeted for the project. "We ended up paying less than $100,000 for what we thought would amount to $250,000," she said, referring to a client/server experiment last year.

CA's moves in particular present an immediate challenge to Oracle and Sybase, said Peter Kastner, an analyst at Aberdeen Group in Boston. "This is the second salvo that CA has fired at the opening of a major software industry pricing war," he said, referring to CA's steep discounting of its CA-Unicenter systems management tools last month.

Wait and see

Other pundits said Oracle and Sybase are not apt to change list prices immediately. "They'll look at the impact [of CA's Ingres price cuts] and then react," said Karen Cone, an analyst at Gartner Group, Inc. in Stamford, Conn.

Oracle recently simplified its convoluted price structure by switching to per-user pricing, so the company probably will not come back at CA with an overt discounting volley, agreed Spencer Lyman, lead analyst at Apollo Group, Inc., which owns the University of Phoenix. But salespeople at Oracle are willing to deal, Lyman said. "A certain realism is beginning to set in that vendors can't charge all over the map because there are just more choices out there now."

On the Sybase side, other than a promise to bring out competitively priced low-end databases in the wake of splitting with Microsoft over SQL Server, the firm has yet to revise pricing significantly, observers noted. But some users have muscled Sybase into providing pure per-user pricing, even though the vendor has not officially changed its price structure from a combination of processor- and user-based tiers.

Oracle and Sybase officials could not be reached for comment.

However, some users will not be able to take advantage of a price war, noted Ann Seki, treasurer at the Northern California Oracle Users Group. "The people at large companies who have negotiated multiyear deals already have to hope that they did the best they could at the time," explained Seki, who works in IS at Chevron Information Technology Co.

Sybase shoots for more customized support. See page 79.

Bank law

CONTINUED FROM COVER 1

$15 million. The older reader/sorters, Fowler said, are incapable of handling foreign deposits.

Analysts said they expect the federal law will generate a flurry of information systems-related activity. Some experts estimated that eliminating duplicate systems, staff and other operations will save multistate banks more than $2 billion over five years — money that could be used for better service and more lending.

Yet most of the major players have already standardized their branch banking platforms across state lines in an effort to reduce costs and achieve economies of scale, analysts and IS executives agreed.

"We operate the bank as a single bank as much as we can, so don't expect any big surprises," said Tim Meier, manager of information services at U.S. Bank in Portland, Ore.

For example, U.S. Bank, which has $21 billion in assets and 420 branches across five states in the Pacific Northwest, last month completed a yearlong effort to standardize its Portland, Seattle and Sacramento, Calif., operating centers. The centers all use IBM's ImagePlus Check Processing Control Systems, which run on a single IBM ES/9000 Model 962 mainframe. The bank's Sacramento facility had been using Unisys Corp.'s Item Processing System, which U.S. Bank obtained through an earlier acquisition of Heart Federal Savings and Loan.

Catch up to the times

However, the new federal legislation also repeals a Depression-era law that required bank holding companies to set up costly and inefficient subsidiaries — and duplicate information systems — in each state where they operate. This portion of the legislation is expected to have a more sizable impact on banks with offices within a few miles of one another that are separated by state boundaries.

For example, customers of Banc One Corp. today are unable to make deposits at the bank's branch in Covington, Ky., to accounts located across the Ohio River in Cincinnati. The new law topples such barriers, enabling banks to provide common services to all customers regardless of location.



Tim Meier: *U.S. Bank standardized centers in three cities*

Banc One, which has acquired 48 banks since 1988, is developing common banking systems for its 1,400 branches and 88 affiliates through a joint effort with Electronic Data Systems Corp. That project, which a Banc One spokesman described as 75% complete, should be finished by mid-1995.

The regional approach

Banc One is not alone in its branch standardization. "We're in the process of integrating all of our regional banks into one," said Craig Goldman, senior vice president and chief information officer at The Chase Manhattan Bank NA in New York. Interstate banking, Goldman said, will "help us to operate with less overhead and combine our various franchises into the New York flagship."

Next year, Chase expects to complete a five-year transition during which it will have consolidated 100 worldwide data centers into six. To date, the consolidations have saved Chase $30 million annually in real estate, staffing and operational expenses.

Corestates Financial Corp. in Philadelphia and First Fidelity Bancorp in Lawrenceville, N.J., are examples of two banks that strategically positioned themselves well in advance of the interstate banking law, said Bill Bradway, an analyst at The Tower Group, a Wellesley, Mass., financial services and technology consultancy.

Corestates and First Fidelity had been forced to maintain physically discrete customer account systems at affiliate locations in New Jersey and Pennsylvania. But both organizations took advantage of a loophole in state regulations that permitted them to consolidate systems across the border as long as the branches were within 30 miles of one another.

Skills gap

Interstate banking will also put a premium on wide-area networking skills — an area where the banking sector has less experience than other industries because of the old prohibitions on cross-border banking, according to M. Arthur Gillis, president of bank consultancy Computer Based Solutions, Inc. in New Orleans.

KeyCorp, which manages 1,300 offices across 23 states, will likely extend its IBM SNA backbone network to accommodate additional cross-border applications and services, said Robert L. Tucker, executive vice president and manager of information services at Key Services Corp., the bank's services subsidiary in Albany, N.Y.

KeyCorp has integrated 80% of the systems from its March merger with Cleveland-based Society Corp. However, it is delaying any wholesale WAN backbone upgrades until the costs of high-speed networks such as frame relay and Asynchronous Transfer Mode have stabilized and the technologies have matured, Tucker added.

Across state lines

"As we talk of competing on the information superhighway, we cannot do it with financial institutions built like Ford's Model T," said one legislator voting to modernize the nation's banking laws last week.

Hyperbole aside, the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 has the following key provisions:

- One year after its enactment, the law will permit bank holding companies to acquire banks in any state. Thirty-four states already allow this.
- After June 1, 1997, bank holding companies can convert their subsidiary banks in different states into branches of the same bank. This is called interstate branching. States have the option of allowing it before 1997, or they may "opt out" of interstate branching altogether.

The second provision may have the biggest effect on both information systems and consumers because it will repeal a portion of the McFadden Act of 1927 that requires bank holding companies to set up separate subsidiaries — and accounting systems — in each state.

Under the current regime, "If we have a Norwest [Corp. bank] account in Omaha, it is no good for cashing a check in Sioux Falls [S.D.] or in Minneapolis because each state has a separate deposit account and separate computer system," said Rep. Peter Hoagland, a Nebraska Democrat.

Consolidating those accounting systems will make banking more convenient for the 4 million Americans who commute across state lines.

—Mitch Betts



A New Way to Slice Up the Pie

I was preparing some graphics for an executive meeting when the vice president's secretary asked me to make a change to one pie chart. The VP wanted one of the slices to be *NEGATIVE!* Needless to say, the software had to be faked out a bit, but the result was what the VP wanted to show, so I guess everyone was happy.

Larry Schmidt
3M Co., St. Paul, Minn.

Name That Tune

A selection of computer-related songs available on numerous file transfer protocol sites on the Internet:

99 Buckets of Bits	The Day Bell System Died
I Want a New Bug	Socket Man
A is for Apple	My Data Over the Ocean
Another Glitch in the Call	Yellow Subroutine
Away in QMANGR	Gateway To Heaven
Lonely Users	The Twelve Days of Uptime
Boot It	Software for Nothing
Core Dumped Blues	Puff the Fractal Dragon
Fifty Ways to Hose Your Code	I'm a PDP-10 Wizard

Viva Vivace

For musicians not interested in the above songs, Code Musics Technology in Minneapolis has developed Vivace, a system that provides interactive musical accompaniment to a soloist performance. The system analyzes and reacts to music played by a wind or brass instrument, with a repertoire of more than 1,100 accompaniments, including classics by Mozart, Handel and Beethoven as well as Dixieland titles and jazz pieces. Musicians can choose the degree to which Vivace should follow the soloist's tempo, change key, customize practice loops and tune their instruments with the system.

Inside Lines

You can't have it all

Most of the new AS/400 operating system announced in May should ship late this year as planned, but sources said a few pieces will slip to February while IBM does additional testing. One person familiar with the project described the delayed components as "pretty esoteric," although some elements of IBM's Client Access/400 software for linking PCs to the AS/400 are on the list. Key pieces — a new file system, database and TCP/IP — will be out this year.

Beta testers offer IBM PowerPC desktop details

Internet users who claim to have beta-tested the system at their sites say IBM's first PowerPC desktop is based on the 66-MHz PowerPC 601 processor and features standard 16M-byte RAM, 540M-byte SCSI disk subsystem, 1M-byte video RAM, two Peripheral Component Interconnect slots, two ISA slots and one-half ISA slot. The system, which can boot itself unattended from a boot-up CD-ROM, will initially offer Windows NT and AIX support and is expected to cost about $3,500.

Daytona apps dress up for their debut

Within 30 days of shipping Daytona, aka Windows NT 3.5, Microsoft will ship its first 32-bit desktop productivity applications for NT. The 32-bit versions of Excel 5.0 and Word 6.0 will support NT's long file names and work with very large data files, Microsoft said.

Under the covers with Sybase and Novell

Sybase plans to disclose a bundling deal with Novell on Oct. 11. The deal, which is an effort to boost Sybase's weak workgroup database strategy, calls for Novell resellers to peddle the Sybase System 10 database with NetWare 4.0, according to an industry source. Oracle signed a similar marketing deal with Novell four months ago. Sybase officials declined to comment.

Hold on to your hardware

IBM officials confirmed that buyers of its new parallel mainframes will be able to keep their boxes and do a board-level upgrade when a faster version of the CMOS processor ships in the second quarter of 1995. As expected, processor speeds will almost double from the current 13 MIPS to 25 MIPS. The number of processors supported by the System/390 Parallel Transaction Server will also increase from 192 to 320, a size users say is more for show.

Taking the low road

As IBM, Toshiba and others announce high-end notebooks, Compaq will take the low road today when it announces the Contura 400. Sources said the notebooks will be based on Intel's 20/40-MHz I486DX2 chip. The products will be the first full-size Conturas to feature PCMCIA with two Type II slots or one Type III slot. The Conturas will feature aggressive pricing — from $2,599 to $3,299 — with either a 9½-in., dual-scan passive-matrix screen or an 8.4-in., active-matrix color screen, sources said. The sources said an interesting feature will be a keyboard that tilts at a 5-degree angle.

Break out your kazoos

The name of the combined entity of SynOptics and Wellfleet is officially Bay Networks, Inc. The two vendors raised the ire of many analysts and reporters last week at Networld/Interop when they hosted a roughly three-hour "nonevent" to announce that the name of the merged company was not — as Cabletron and Cisco representatives are fond of saying — going to be "WellFloptics."

As a crowd of Networld/Interop attendees gathered around Microsoft's first public demo of its Hermes Systems Management Server product last week, a number of people began chuckling. The reason? A rather subtle typo in a text bullet that was supposed to read "... user having trouble with his floppy disk." Alas, the final 's' had somehow become the third letter of the alphabet. To alert Computerworld *about our own typos, or better yet, to pass along news items or tips, call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.*

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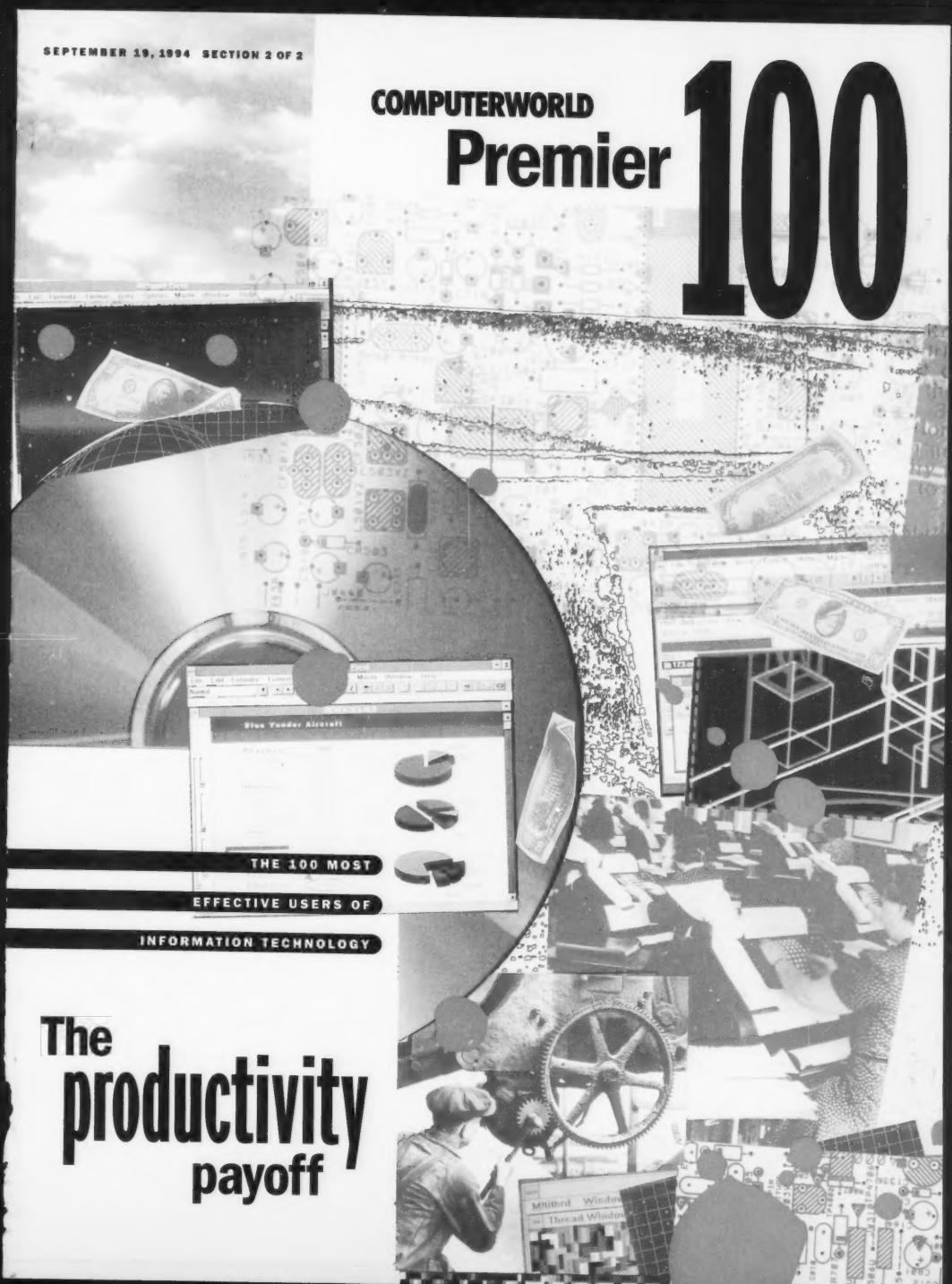
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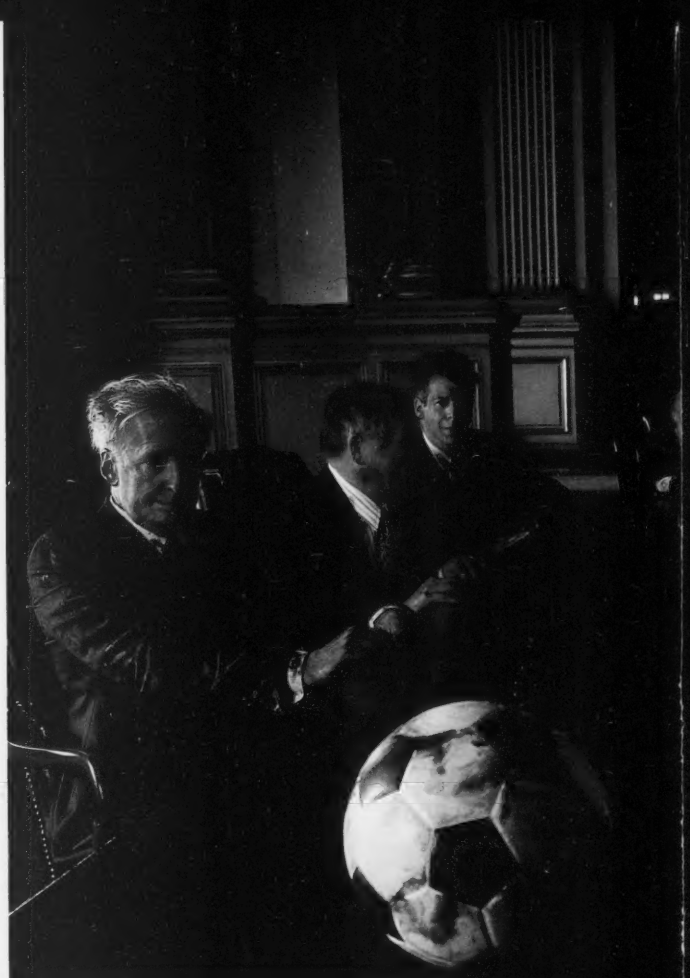
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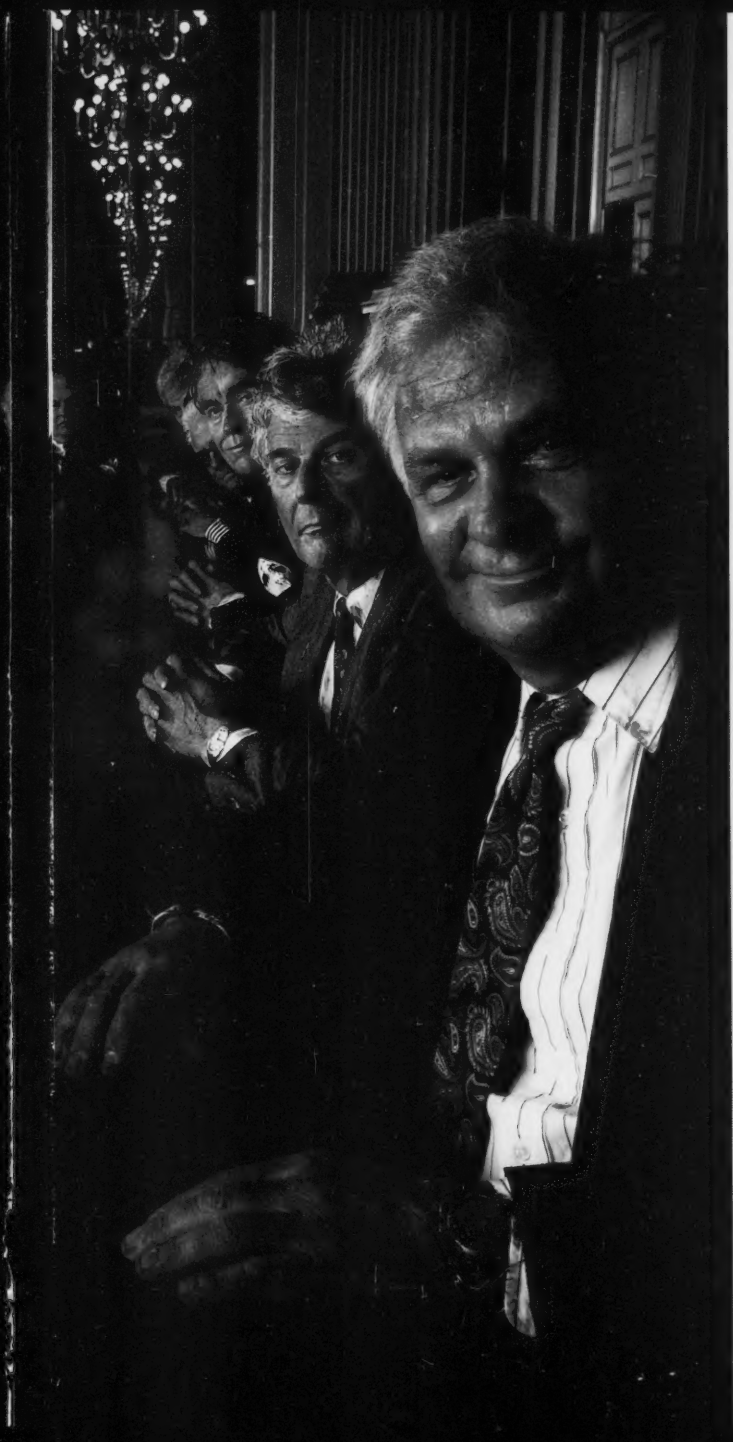
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the 100 most effective users of information technology

1 Unifi, Inc.	26 Cone Mills Corp.	51 Johnson & Johnson	76 Fifth Third Bancorp
2 Illinois Central Corp.	27 Merck & Co.	52 Newell Co.	77 Ameritech Corp.
3 Ambac, Inc.	28 Briggs & Stratton Corp.	53 NALCO Chemical Co.	78 Rhone Poulenc Rorer, Inc.
4 ARA Group, Inc.	29 Merrill Lynch & Co.	54 Lancaster Colony Corp.	79 General Mills, Inc.
5 UST, Inc.	30 Boston BanCorp.	55 E-Systems, Inc.	80 PaineWebber Group, Inc.
6 Fluor Corp.	31 Sunbeam-Oster Co.	56 Nike, Inc.	81 Turner Corp.
7 MAPCO, Inc.	32 Salomon Brothers, Inc.	57 Advanta Corp.	82 Hon Industries, Inc.
8 MBIA, Inc.	33 Coca Cola Co.	58 Southwestern Bell Corp.	83 MBNA Corp.
9 U.S. Healthcare, Inc.	34 Bristol-Myers Squibb Co.	59 Travelers Corp.	84 General RE Corp.
10 Amgen, Inc.	35 Praxair, Inc.	60 Charter One Financial, Inc.	85 First Virginia Banks, Inc.
11 Newmont Mining Corp.	36 Charles Schwab Corp.	61 Gap, Inc.	86 Allergan, Inc.
12 Cooper Tire & Rubber Co.	37 Gannett Co.	62 Valspar Corp.	87 Leggett & Platt, Inc.
13 Great Lakes Chemical Corp.	38 GEICO Corp.	63 Bankers Trust New York Corp.	88 May Department Stores Co.
14 Abbott Laboratories	39 Levi Strauss Associates, Inc.	64 McDonald's Corp.	89 Hershey Foods Corp.
15 International Flavors & Fragrances, Inc.	40 Dibrell Brothers, Inc.	65 Reebok International Ltd.	90 Hillenbrand Industries, Inc.
16 The Bear Stearns Cos.	41 Gerber Products Co.	66 First Commerce Corp., LA	91 Stewart & Stevenson Services
17 Walt Disney Co.	42 Rubbermaid, Inc.	67 Sigma Aldrich Co.	92 Tribune Co.
18 CSF Holdings, Inc.	43 Medtronic, Inc.	68 Thiokol Corp.	93 Reader's Digest Association, Inc.
19 Ace Hardware Corp.	44 American President Cos.	69 JP Morgan & Co.	94 Wal-Mart Stores, Inc.
20 Waste Management, Inc.	45 H&R Block, Inc.	70 Rockwell International Corp.	95 Sonoco Products Co.
21 Collective Bancorp, Inc.	46 Raytheon Co.	71 Emerson Electric Co.	96 Gillette Co.
22 Schering-Plough Corp.	47 Kellogg Co.	72 CPC International, Inc.	97 Werner Enterprises, Inc.
23 Fruit of the Loom, Inc.	48 Worthington Industries, Inc.	73 IDS Financial Corp.	98 Avon Products, Inc.
24 Morgan Stanley Group, Inc.	49 United Healthcare Corp.	74 H. J. Heinz Co.	99 Dover Corp.
25 American Home Products Corp.	50 W. M. Wrigley Jr. Co.	75 3M Co.	100 Upjohn Co.

from the Editor

More for the money

Do more with less.

It's the business mantra of the '90s. Recession and decentralization have wreaked havoc on corporate hierarchies. Layoffs have eroded the bonds of trust between employer and employee. Globalization has expanded competition beyond U.S. shores.

All this has hit corporate IS hard. Technology has become a deluge, with project cycle times measured in days. Meanwhile, management is increasingly suspicious of the productive value of the computing investment. Service sector productivity was flat during the 1980s, and CEOs are rightfully asking whether the trillion dollars U.S. business spent on computers will ever pay dividends.

It was with this new reality in mind that we substantially revised the selection criteria for this year's *Premier 100* ranking.

Throughout the previous six years of the *Premier 100*, we used a metric that favored companies that spent heavily on IS, invested in end-user computing and also achieved high profitability.

Noble goals, but not in line with the realities of the '90s. We decided this year to revamp and simplify the selection criteria for the *Premier 100* to recognize companies that spend the least on IS and get the greatest business value.

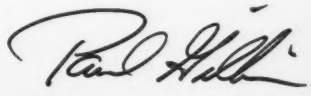
To assemble the rankings, we turned to Paul Strassmann, a veteran CIO and one of the leading authorities on the productivity of the IS investment. Strassmann's Information Productivity Index enabled us to select the *Premier 100* based on publicly available data. For a detailed methodology, see his introduction to the charts on page 45. We then surveyed the Top 240 companies so we could compare those in the Top 100 with others that finished in the second tier. Our goal was to find out what these effective users are doing right.

On the following pages, you'll see what we learned. The *Premier 100* are doing more with less, and they're doing it well.



THE PREMIER 100 TEAM (from left to right): Michael L. Sullivan-Trainor, Kimberlee Smith, Catherine McCrorey, Stephanie Faucher, Kevin Burden, Renee Barber and Paul Gillin

We are interested in hearing your reactions to the *Premier 100*, our selection method and the special issue you're now reading. Contact me directly at (508) 620-7724 or, if the Infobahn is your thing, send me a message via MCI Mail at 575-4120 or the Internet at pgillin@cw.com. □



PAUL GILLIN

ACKNOWLEDGMENTS

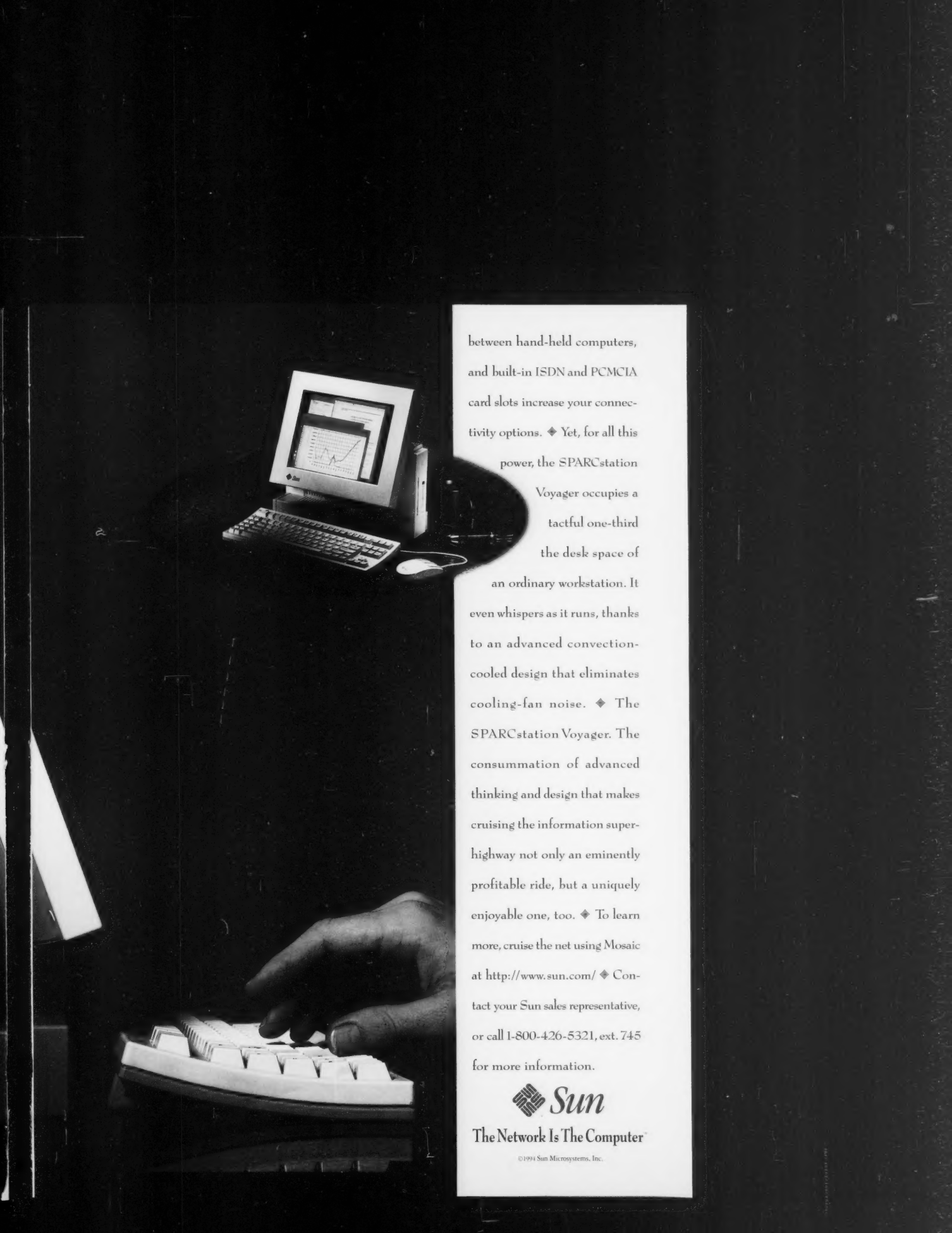
Computerworld would like to thank Paul Strassmann for his advice and assistance on this project. We are also grateful to the *Computerworld* Database Division and Computer Intelligence for providing research assistance. And special thanks to all the IS executives and their staffs for enduring many phone calls and requests for information during what should have been a normal summer.

illustration by M.A.D.; *photograph by* RALPH MERCER



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BY MICHAEL L. SULLIVAN-TRAINOR

best of breed

Balancing **tight budgets** and targeted technology **spending** are keys to **success** for Premier 100 **companies**

Despite the high-growth, high-profile image of computer technology, life for the corporate information systems executive has never been tougher.

"CIOs face the paradox of keeping overhead costs down while providing the company with the greatest benefits of the latest technology," says Richard Swanborg Jr., managing director at Tradewinds, a Cambridge, Mass.-based IS management consultancy.

Our analysis of survey data from the *Premier 100* companies reveals that cost pressure is evident. The average budget as a percentage of revenue for *Premier 100* companies is 2% — about the same as for the 782 firms surveyed by CSC Index, Inc. in its 1994 budget survey (see chart).

For our second-tier companies — those that fell just below the Top 100 ranked by information productivity — the average budget percentage is 3%.

Budget growth, which in the CSC Index sample has steadily declined from 7.5% in 1989 to 2.3% this year, is also lower for the *Premier 100*'s Top 10 than for the rest of the 100 and those below the 100 rank (see chart).

Yet a miserly approach to IS alone fails to address the other side of Swanborg's paradox. IS executives must also help their companies capitalize on technology.

Take the case of Waste Management, Inc., ranked 20th among the 1994 *Premier 100*. The $7 billion-plus waste collection and disposal firm has steadily reduced IS spending in recent years, including a 26% reduction this year, yielding a $73 million IS budget.

"But we've been very effective in managing our portfolio of applications to increase functionality and still upgrade hardware," says computer services director James C. Murphy.

Murphy's law? Automate and focus.

"We're holding the line on personnel,

Going down

Companies with the highest information productivity spend a smaller percentage of their revenue on IS

PREMIER 100	AVERAGE 1994 BUDGET AS A PERCENTAGE OF REVENUE
TOP 10	1.3%
TOP 100	2%
BOTTOM 100	3%
1994 CSC INDEX BUDGET SURVEY	2%

(782 organizations surveyed)

Going up (slowly)

Top companies also advance their budget more slowly

PREMIER 100	1993-1994 BUDGET GROWTH
TOP 10	4.3%
TOP 100	8.4%
BOTTOM 100	10.2%
1994 CSC INDEX BUDGET SURVEY	2.3%

(782 organizations surveyed)

Stealth spending

But more money is going outside IS for the best performers

PREMIER 100	PERCENTAGE OF NON-IS SPENDING EQUAL TO IS BUDGET FOR 1994
TOP 10	22%
TOP 100	19%
BOTTOM 100	15.5%
ANALYSTS' ESTIMATES	30%-50%



Illustration by MARTY GUNSAULUS

and automation is real key to that," Murphy says. The data center is the primary focus of automation projects, which let it run more effectively with fewer staffers. The *Premier 100* companies, on average, have a low ratio (.03 to 1) of IS staffers to employees.

Sometimes the executive's balancing act is aided by business conditions.

For example, W. Ben Kuenemann, senior managing director of information services at 16th-ranked The Bear Stearns Cos., is riding the wave of 25% growth in the financial services firm's $57 billion assets from 1992 to '93 and 23% growth in its $362.4 million in profits. "We're growing so fast as a business that we're really focused on the revenue generation side as opposed to the cost containment side," he says.

But the job is subtler than blowing with the winds of financials. Keeping IS on course requires consistently tight management of the IS budget's bottom line while making discrete investments in new applications and platforms. The ability to measure return on investment (ROI) is key to this strategy. Ninety-five percent of *Premier 100* executives rated ROI measures as very important to getting project approval.

Overall, the *Premier 100* survey shows the need to keep certain new investments as high as business conditions permit while holding the lid on infrastructure growth. Hardware investments are only 15% of the budget, on average, while new development consumes more than 50%. Client/server garners 41% of system development spending.

In addition to the resource distribution challenge, top IS executives create policies that keep their staffs and peers aimed at the right targets.

Amgen, Inc., ranked 10th, uses a highly decentralized IS structure to support its biotechnology breakthroughs, but Bruce D. Whetstone, director of corporate information technologies, does have veto power. "I don't use it as a club, but I will challenge certain acquisitions," he says.

AVOID TUNNEL VISION

Another valuable lesson learned from top IS executives is to pay attention to the architecture over the long term. Bankers Trust New York Corp., ranked 63rd, has been nurturing an architecture based on distributed computing, consistent platforms and application interoperability for 10 years.

Now, with profits up 30.7% to $996 million and assets up 27.1% to $92 billion, the bank is spending richly on client/server. The $550 million IS budget is up 18%, with 80% of the investment in new development on client/server.

"Many people equate client/server with downsizing," says Lyle Anderson, the bank's vice president of technology strategic planning. "That's not what we're doing. We're doing client/server on industrial-strength platforms and building our own middleware to allow interoperability."

Fifty-eight percent of *Premier 100* executives say architecture is extremely important to their strategies.

Yet regardless of strategy, *Premier 100* IS execs have the same objective. "It absolutely concerns me that we're making people more productive," says Patrick Zilvitis, vice president of corporate information technology at 96th-ranked Gillette Co. "If we aren't, we shouldn't do what we're doing." □

Sullivan-Trainor is a Computerworld *editor, CW Guide.*

Technology shift

Client/server investments claim a large piece of development for all companies

PREMIER 100	CLIENT/SERVER PERCENT OF DEVELOPMENT BUDGET
TOP 10	30.5%
TOP 100	43%
BOTTOM 100	41%

Although the Top 10 Premier 100 companies devote a lower percentage of their development budget to client/server, they rated it 3.9 on a five-point scale, where five is most important. The Top 100 companies rated it 3.8. The Bottom 100 companies rated it 3.9.

pressure to produce

Is IS making us **more productive?**

The answer, **finally,** may be **yes**



BY PAUL GILLIN

Unifi, Inc. recently equipped 20 salespeople with $3,000 worth of laptop gear each. These salespeople now have more current and relevant information available to them and can upload sales orders directly to headquarters. But has the $75,000 investment in hardware, software, support and training made them more productive?

"That's a tough one," says Jerry Moore, vice president of MIS at Greensboro, N.C.-based Unifi. "Our management has bought off on the project because the information's more timely. But I don't know that we can break down [the benefit] into dollars and cents."

Unifi's situation isn't unusual. Corporate information systems departments are finding it harder and harder to justify the productivity benefits of large projects using age-old criteria such as return on investment (ROI) or return on assets. New classes of systems projects — for example, groupware, decision support and data warehousing — are forcing the issue of how to measure benefits when the benefits are fuzzy criteria such as improved customer satisfaction.

But *Premier 100* IS departments are learning to cope. IS executives say they are relying more than ever on business unit partners to throw their weight behind systems projects, and they're learning how to use new metrics that show heretofore hidden benefits of the IS investment.

Experts say the big measurement problems stem from the question of how to measure business value. "The problem with value is that it's undefined," says Thornton May, vice president of research and education at Cambridge Technology Partners in Cambridge, Mass. "There's nowhere on your balance sheet for defining how smart your people are or how fast you get to market."

"White-collar productivity studies are almost impossible to do," says Erik Brynjolfsson, assistant professor of management at MIT in Cambridge, Mass., and author of a 1993 study on the topic. "It's hard to quantify quality, variety, customer service and responsiveness. But these are things that in-

Illustration by LARRY GOODE

formation technology contributes to a lot."

It's sometimes called the productivity paradox: Corporate America spent about a trillion dollars on computing in the 1980s, while nonmanufacturing productivity stayed almost flat. *Fortune* magazine opined last year that "information technology is already one of the most effective ways ever devised to squander corporate assets." The magazine pointed out that spending on IS has nearly doubled as a percentage of U.S. capital investment in 12 years, with virtually no productivity results to show for it.

SHIFTING PARADOX

However, opinion is clearly beginning to shift on the productivity paradox. Recession and global competition have forced U.S. companies to finally use the technologies they put in place during the past 10 years with corresponding productivity leaps. Business managers are more convinced than ever of the computing payoff potential.

Recent research has demonstrated that the payback is finally arriving, but *Premier 100* IS directors say the black eye IS got during the Trillion Dollar Decade, combined with tighter IS budgets in general, forces them to justify computing expenses more than ever.

"We do a strict return on investment analysis on every project over $75,000," says the chief information officer of a major Midwestern industrial company who asked not to be named.

"If we can't justify an investment on hard dollars, we get the management together and present the facts. If management buys it, we do the project," Unifi's Moore says. "But it's known up front that there aren't hard dollar returns."

But *Premier 100* CIOs also say the productivity question has become a moving target. With fewer and fewer IS projects providing simple cost savings by replacing people, savvy IS people are shifting the responsibility to end-user departments. As a result, users are increasingly paying for their own computing needs (see story page 20), and IS chargeback is staging a revival.

"We charge out everything we do," says W. Ben Kuenemann, senior managing director of information services at The Bear Stearns Cos. in Whippany, N.J. "Why should I be held responsible for the productivity of the user community?"

Like many financial firms, Bear Stearns enjoys a tight link between the IS function and business departments. "In this business, until we can automate a product, we don't *have* a product," Kuenemann says.

That makes it easier for the firm to build systems that don't have hard dollar deliverables. For example, the firm is now building a common workstation front end for its traders that has slick editing and validity checking along with automatic routing of trade orders. The payback: improved control, reconcilement and consistency but not necessarily cost reduction.

Tribune Co. in Chicago recently undertook a large database marketing system project without going through an ROI process, according to John Kazik, senior vice president of IS. Kazik says executives believe in the project on a gut level. "We just felt it was important to the future for us to have direct, targeted delivery of information."

USER ACCOUNTABILITY

The importance of business-level accountability reverberates during interviews with *Premier 100* CIOs. Too many IS directors were burned by spectacular systems failures and overblown expectations during the '80s, they say. Now the expectation is that the user should take the credit — or blame — for the payback of the project.

"We allocate [information technology] resources based on the business plan," says Don Schuman, vice president of IS at Ace Hardware Corp. in Oak Brook, Ill. "Once the officer responsible for the functional area decides this is a priority, he gets the resources to do it."

Ace has installed a new replenishment system for its 14 distribution centers, each of which stocks more than 60,000 items. The system's decision support tool is used by fewer than a dozen people and was almost impossible to justify on an ROI basis, Schuman says. The business managers had to see the value. "Did we eliminate rebuying people? No. Did we increase inventory turnover? Yes. Was it because of the system? We don't exactly know, but inventory turn did improve, and that's what counts to the business manager," he says.

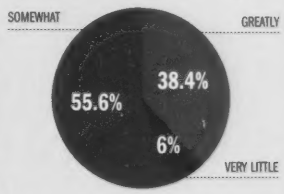
Those who believe in the IS productivity payoff generally agree that the reason the benefits of investment haven't shown up is that statisticians are measuring the wrong thing. Output of widgets per hour is a lousy measure of white-collar worker productivity, they say, particularly when corporations are automating production jobs out of existence but actually adding office staffers to administer the automat-

continued on page 12

More for the money

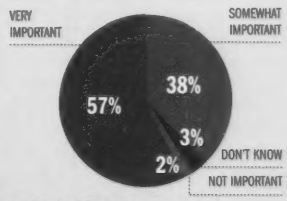
Premier 100 executives are seeing a productivity payoff . . .

How much do you think your company's information technology investment has enhanced white-collar productivity?



. . . but are still cautious in how they spend money on information technology

How important are return on investment criteria to justifying new projects?



Source: *Premier 100* survey

continued from page 11

ed systems on the factory floor.

"Our total inventory isn't down from 10 years ago, but we are carrying more products," says John Mitchell, director of IS at Cooper Tire & Rubber Co. in Findlay, Ohio. "Today, we're twice as big a company, and we carry three times as many products. Our white-collar workers do more than they used to do."

One reason that criticism of IS as a financial black hole is finally softening is that the recession highlighted benefits of the information technology investment that no one had even seen before, productivity advocates say.

"I contend that all the PCs and voice mail and cellular phones and such we've installed in the last 10 years have enabled the cost reductions we're seeing throughout the country," says Tribune's Kazik. "Companies are saying we don't need all these white-collar people anymore, and that's because of information technology."

Kazik's conviction is shared by Jerry Loev, president of CSC/Impact, a new IS management consulting arm of Computer Sciences Corp. Loev says IS got a bad rap during the booming '80s — not because the productivity benefits weren't there but because there was no need to take advantage of them.

"How were we able to do all this downsizing, particularly in the middle management layers, all of a sudden?" Loev asks. "I think the answer may be that that trillion-dollar investment [in the 1980s] was worthwhile, and one reason we didn't get the payoff then was that companies didn't have to take those drastic personnel actions."

Loev contends that the flattening and decentralization that has gone on in corporate America in the past five years has been enabled by the availability of cheap, powerful technology. Moreover, computers have enabled businesses to enter new markets more quickly because of the reduced need for administrative support and the availability of better information.

What's more, the payoff usually doesn't come so much from the direct application of technology as from the process changes that technology inspires. Unifi's installation of an imaging system revealed that a large amount of employee time was being spent shuffling paper, Moore said. As a result, invoice reconciliation was shifted to an automated system.

According to Cambridge Technology Partners' May, group-oriented technologies such as LANs and shared databases can reveal assets a company never knew it had. "Companies will go out and pay high prices to get intellectual assets that they already have but don't know about," he says. "When you can now communicate point to point throughout the organization, you can find out more easily where these resources are."

Productivity figures also fail to measure opportunity costs, which CIOs say are an increasingly important driver of IS investment. "Putting in a phone line to let an outside shipper access our credit system will cost us $12,000 a year," Unifi's Moore says. "Is that worth doing? Well, one bad credit decision will cost us far more than that."

In fact, lost opportunity is becoming a major selling point for new projects. IS executives point out that intangibles such as happy customers and quick delivery times translate into repeat business and, ultimately, bigger profits. And end users empowered by decision support and analysis tools are more likely to steer companies toward new opportunities that otherwise would never have been seen.

Ultimately, a chief executive officer who is passionate about the business potential of technology is an IS manager's best friend.

"Our top management is not in love with [information technology], but they are very adamant about quality, customer service and being low cost," Cooper Tire's Mitchell says. "We pursue every investment with that in mind." □

Gillin is Computerworld*'s editor.*

for more info

Here are some sources for more information about information systems and productivity:

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"IS INFORMATION SYSTEMS SPENDING PRODUCTIVE? NEW EVIDENCE AND NEW RESULTS," by Eric Brynjolfsson and Lorin Hitt, *MIT Working Paper*, September 1993.

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"IT ENHANCES ORGANIZATIONAL PRODUCTIVITY: FACT OR FANTASY?" by Doris G. Duncan, *Information Executive*, Sept. 22, 1991.

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THE BUSINESS VALUE OF COMPUTERS, by Paul Strassmann, Information Economics Press, 1990.

COMPUTERS AND PRODUCTIVITY, by Michael Dertouzos, MIT Press, 1989.

"AN ASSESSMENT OF THE PRODUCTIVITY IMPACT OF INFORMATION TECHNOLOGY," by Gary Loveman, MIT Management in the 1990s program, July 1988.



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   (c) OS/2 (g) Windows
   (d) Unix (h) NeXTstep

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defying the odds

BY KEVIN BURDEN

In the textile industry in which foreign competition has buried 80% of the U.S. firms in the past 25 years, the success of Unifi, Inc. is almost miraculous.

Ranked tops among the Fortune 500 for sales growth — 147% from 1991 to 1992 — and No. 8 for the highest total return to investors over a 10-year period, Unifi controls 60% of the domestic polyester textured-yarns market and 15% of the European market. Since its inception in 1971, the Greensboro, N.C., company has never had a losing year.

One secret of its success lies in the company's "Quality through Pride" slogan, which is fervently embraced by its 4,700 workers.

Another is fanatical devotion to cost control. In a market in which price is a major competitive factor, Unifi has consistently kept its sales and administrative expenses below 3% of net sales for several years — evidence of a very lean company that has been able to underprice most of its competition.

That attention to doing a lot with a little earned Unifi the top spot in this year's *Computerworld Premier 100*.



UNIFI'S JERRY MOORE maintains a corporate philosophy that technology is a strategic tool

photograph by WILLIAM MCINTYRE

WEAVING SUCCESS

Unifi is riding success in polyester, nylon and cotton textiles into new markets. In 1991, the company virtually doubled in size when it bought its largest competitor, Macfield, Inc., with a $360 million stock swap. Less than two years later, Unifi entered the spun yarn market, one of its final frontiers, with the acquisitions of Vintage Yarns, Inc. and Pioneer Corp.

"With these deals, our product line is now complete, and we will probably be looking to acquire other spun yarn companies," says Jerry Moore, vice president of MIS.

While its mahogany-paneled executive suites and dress codes indicate that Unifi still clings to tradition, the company embraces an operational philosophy that is very New Age.

No. 1 **Unifi** rides the **growth rocket** in a mature industry by **challenging** convention

From the top down, technology is viewed as a strategic tool. Knowing workers can increase productivity only so much before they hit a wall, Unifi realized early on that if it were to continue its growth, it would need to do it through technology.

Unifi was the first company to install 900 meter/min. texturing in the late 1970s, an upgrade most textile compa-

continued on page 16

Meet a man with a clear vision.

The industry is rapidly changing. The competition is becoming intense. Your customers are demanding better, more affordable service. Your employees need faster, more efficient access to information.

Sound familiar? Throw in the fact that you've got 2.3 million customers spread over four states and you've got a typical day at the office for Dennis Walsh, CIO of Entergy, one of the largest electric utilities in the United States.

Making the decision.

When Walsh joined the company in December 1991, he saw that Entergy's mainframe/PC environment didn't allow for nearly enough interactivity and made custom-application development a slow, expensive process. He felt client-server computing was the way to go and tested configurations from several of the leading suppliers.

"We chose Sun because their technology offers the price/performance, flexibility, and tools to build sophisticated, networked business systems that will allow our employees to make faster, well-informed decisions," Walsh says. "The combination of SPARC chip technology and the scalability of Solaris software gives Sun a significant advantage over its competitors. We're very pleased with the products we have from Sun."

Making the move.

With 10,000 employees in more than 100 sites, Entergy needed a flexible, powerful information system environment—fast. They got it. And they got a pleasant surprise: They did it ahead of schedule.

"It's an astonishing effort in my mind," Walsh says. "We've been able to do things faster than anyone would have thought possible."

Since installing their first Sun® system in July of 1992, Entergy is currently running 33 SPARCcenter™ 2000 and SPARCserver™ 1000 systems networked to their PCs with FDDI, Token Ring, and Ethernet. So employees are now able to access, manipulate, and share information much more quickly, regardless of their location. And they're able to develop custom applications faster, keeping them a step ahead of the competition.

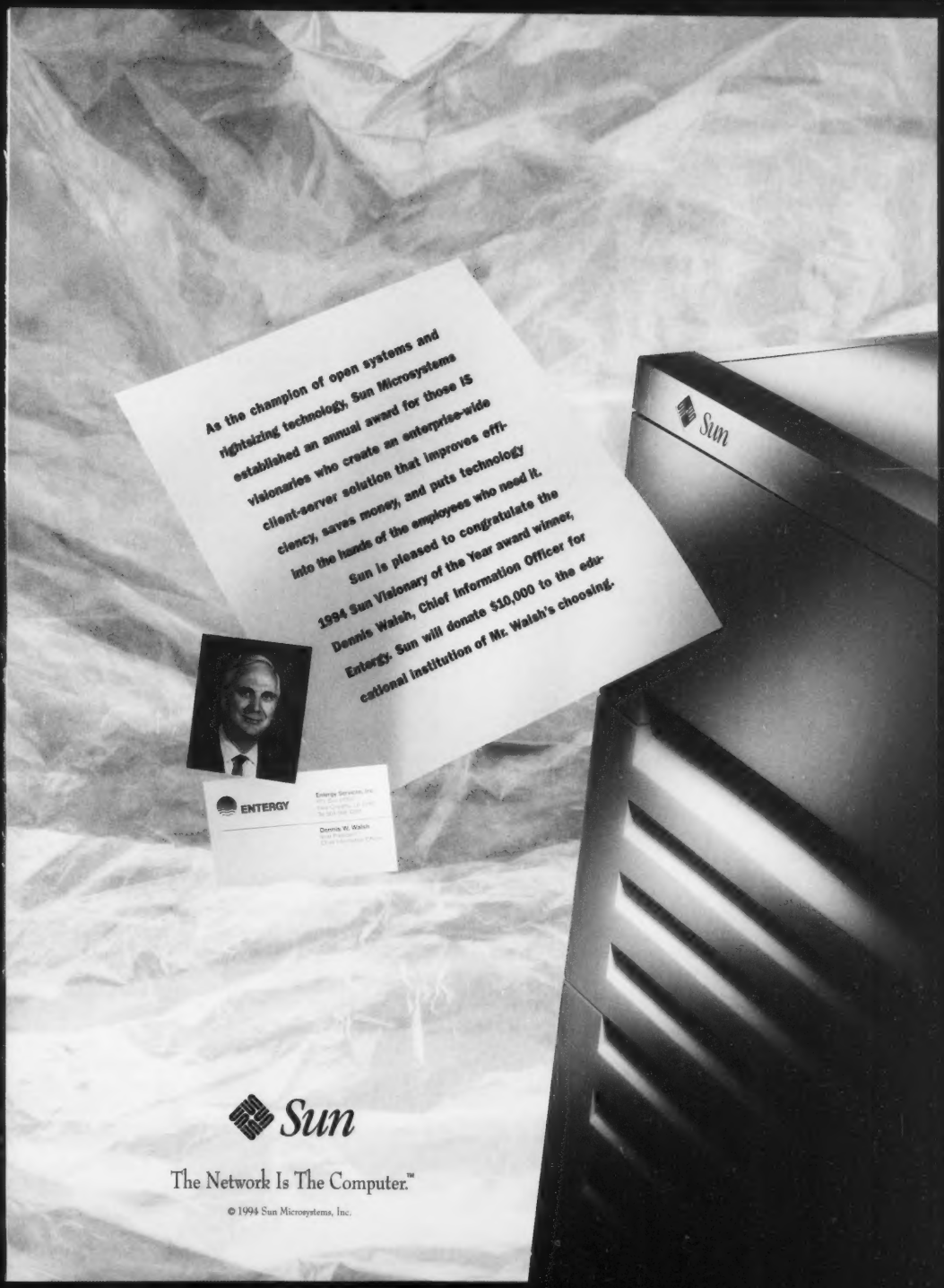
Walsh notes, "We're running our mission-critical applications on Sun: all our financial systems, our data warehouse, our budget system, our work-management system, and automated mapping and facilities management—everything."

Making the grade.

Typical of the man who saw how to integrate his heterogeneous, far-flung enterprise into an efficient, productive network, Walsh refuses to take all the credit. "It's easy to have a vision," he says. "You've got to have people who can deliver it."

Obviously, Entergy and Sun have just those people. "Clearly it takes a team effort to make it a reality. It's only possible with a very dedicated group of people who are willing to take prudent risks and commit to the task. And that's what has happened."




As the champion of open systems and
rightsizing technology, Sun Microsystems
established an annual award for those IS
visionaries who create an enterprise-wide
client-server solution that improves effi-
ciency, saves money, and puts technology
into the hands of the employees who need it.
Sun is pleased to congratulate the
1994 Sun Visionary of the Year award winner,
Dennis Walsh, Chief Information Officer for
Entergy. Sun will donate $10,000 to the edu-
cational institution of Mr. Walsh's choosing.
Sun
ENTERGY
Dennis W. Walsh
Sun
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UNIFI'S PREMIER TEAM (top): LaVern Payne, Jodi Foran, Steve Holley, Keith Gaskill, Richard Lucas, Chris Dorsett; (bottom): Roxann Hooks, Craig Wilson, Jerry Moore, Richard Stevens

continued from page 13

nies did not make until the '80s. Substantial modernization and plant automation investments increased yarn productivity at its Yadkinville, N.C., plant from 3.1 million pounds a week in the early '80s to 5.2 million pounds a week today with 400 fewer workers.

"We don't necessarily abandon the way things have been done in the past. We just first look for ways to take advantage of today's technology," Moore says.

"There was a time when we would have stacks of invoices lying around here," he adds. "Today, they are all scanned and can be printed on one sheet of paper if needed." Imaging technology implemented last summer eliminated much of the paper shuffling, bringing a greater level of efficiency to the company's sale and purchase transactions. "We were also able to use many employees in more meaningful tasks," Moore says.

With a crop of IBM AS/400s running the business, Unifi has committed 28% of its new software development to client/server. "We have several scattered systems right now but are working on an overall strategy to glue them all together," Moore says.

While he has a hard time envisioning the day when client/server will replace his core AS/400s, Moore does feel it will keep him from having to upgrade to larger boxes.

The very structure of the information systems department promotes change. Take LaVern Payne, Unifi's plans and analysis manager. His sole purpose is to question processes and evaluate how new technologies might improve them.

"I have encountered zero opposition to any new ideas or technologies," Payne says. "All I ever need to do is make the business case and show how the technology applies. Once that is done, the process moves very quickly."

ACTION FIRST

The 66-member IS staff, though the largest staff Unifi has had to date, has about two-thirds the IS staffer/employee ratio that the other *Premier 100* companies have. That is part of the reason why decisions are made so rapidly.

"Benefits are visualized rather than cost-justified," Payne says. "Our IS staff is relatively small; therefore, we cannot afford to get caught up in tons of analysis."

Once Payne completes a strategic evaluation, the project is quickly handed off to the development staff. "We do not want anyone getting bogged down here," Moore says. "Thirty days after the project is done, I want . . . them out of it."

Even with the relatively small IS staff, outside service providers are used minimally. "Only if we get bottlenecked in a project or require expertise in a certain technology area that we do not have do we turn to outside help," Moore says. "Otherwise, we do everything we can in-house and try to involve as much of our staff as possible so they feel a part of the team as well as the benefits of their efforts."

Just-in-time delivery demands from retailers require that manufacturers stay in steady contact with suppliers. Electronic data interchange (EDI) has been a part of Unifi's integrated system since 1989. Today, the company is connected to approximately 200 textile manufacturers and suppliers. About 40% of outbound customer shipments and 95% of inbound go through EDI.

While Unifi encourages innovation, it is pragmatic about it. "We have two major plants, but only one of them is networked," Moore says. "Once we get the systems fully developed and know the prototype will work, only then will we tie in the other." □

Burden is Computerworld's *senior researcher, Firing Line/Scorecard.*

Lean and mean

A 70:1 employee-to-IS staff ratio marks Unifi's low overhead approach

COMPANY	Unifi, Inc.
LOCATION	Greensboro, N.C.
INDUSTRY	Textiles
NUMBER OF EMPLOYEES	4,777
NUMBER OF IS STAFF	66
1994 REVENUE	$1.39B
1994 IS BUDGET	$6M
PERCENT OF SPENDING ON CLIENT/SERVER PROJECTS	28%

photograph by WILLIAM MCINTYRE

the rest of the best

Rounding out our Top 10 list . . .

BY RENEE BARBER

Companies ranked two through 10 in the 1994 *Premier 100* come from six industries and seven states, but all have one thing in common: cost consciousness. Here's a brief look at the IS strategies of these companies.

Illinois Central Corp. 2

The country's 10th largest railroad company is focusing new information systems initiatives on cutting costs while improving customer support. Two years ago, Illinois Central relocated its data center from Chicago to the suburbs in a move to disperse IS functions into departments and cut space costs, according to Norman Schwarz, director of technical network support. Operationally oriented transportation systems have been outsourced, a move that Schwarz says not only saved costs through consolidation but also allowed the firm to quickly add electronic data interchange (EDI) capabilities.

In April, the company installed an IBM ES/9000 (9221) and is now in the process of migrating applications from an aging IBM 3081 to the new system. A new personal injury claims database will track medical and legal cases against the firm. It is also expanding its use of handheld technologies for inventory and car repair billing information.

Expanded EDI use not only provides shipping instructions and communication between Illinois Central and other railroads but also allows shippers to dial in and run their own queries. The report is then sent to the shipper via mailbox or fax and allows the shipper to better plan production schedules.

Ambac, Inc. 3

This financial services holding company has made aggressive investments in technology recently to achieve its objective of being "the premier supplier of credit enhancement and information services within the markets in which we choose to compete," according to Chief Executive Officer Phillip Lassiter's an-

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FLUOR'S KEN CAIN: IS' future success depends on its ability to use infrastructure Fluor has built

photograph by LARA JO REGAN

continued from page 17

nual report message.

To support that charge, Ambac's IS department has developed systems for underwriting and surveillance, tracking new business and monitoring the firm's existing book of insured transactions. Ambac also attributes much of its success to the implementation of on-line services this year. Ambac IS executives declined to be interviewed.

Information services expenses for last year were $28.3 million, up 34% from 1992. However, much of the increase was due to Ambac's need to fund development of new product lines for Healthcare Knowledge Resources, a health care information services firm that its Health Care Information Services (HCIA) subsidiary acquired in 1992.

HCIA became profitable last year and contributed to Ambac's record net income of nearly $180 million on revenue of $327 million.

4 ARA Group, Inc.

One of the nation's largest food and diversified services firms has recently undertaken major IS initiatives designed to give business unit managers more face time with customers. The focus in ARA's food services business units is to cut administrative duties and streamline back-office work, according to John Kallelis, vice president of information technology. The company is also fine-tuning its billing system.

For ARA's food services, IS has developed a food production system that designs menus according to nutritional content, prior sales and demand. Also, IS is expanding its EDI use in its textile rental services to provide a single bill to each of its 60-plus national accounts.

A streamlining effort increased ARA's 1994 IS budget by just 2.5%, but financial support stayed strong for new software development in order to continue operational improvement. Much of IS' investment is dedicated to client/server, and its goal is to move 40% of its applications to client/server within three years.

Industry leaders

Services firms dominate the *Premier 100* list when ranked by vertical market

NUMBER OF COMPANIES	CATEGORIES OF PREMIER 100 COMPANIES
12	Financial services
11	Diversified services
10	Pharmaceuticals
8	Food
6	Commercial banks
5	Electronics
5	Savings banks
4	Chemicals
4	Retailing
3	Farm equipment
3	Metal products
3	Publishing and printing
3	Transportation
2	Apparel
2	Furniture
2	Photographic equipment
2	Plastic products
2	Soaps and cosmetics
2	Textiles
2	Tobacco
2	Utilities
1	Aerospace
1	Beverages
1	Forest products
1	Life insurance
1	Metals
1	Gold mining
1	Petroleum refining

The firm's information systems and staff are decentralized — there are only 12 corporate staffers — and Kallelis says a plan to bring business units closer together by creating "collaborative" support services throughout the corporation won't harm ARA's decentralized philosophy.

5 UST, Inc.

The $1.1 billion holding company for four wholly owned subsidiaries — United States Tobacco Co., International Wine & Spirits Ltd., UST Enterprises, Inc. and UST International, Inc. — continues to grow in a declining market. Sales increased 7% last year, and net earnings climbed to $349 million — a 12% gain.

Because it produces the dominant share of smokeless tobacco products in an antismoking environment, UST has been able to raise prices, maintain profits and increase unit volume.

Last year, UST continued to make investments in technology to improve quality and productivity. IS is responsible for developing and improving systems to monitor growing conditions and crop yields in the regions that supply the company's tobacco.

IS is also responsible for developing shipping systems that ensure distributors have the freshest possible supply of UST's smokeless brands in stock. These systems also monitor sales and inventory so that UST's products are brought to market in a timely manner.

Fluor Corp.

The key word at Fluor, the country's largest international engineering and construction firm, is communication. To compete more effectively in far-flung overseas operations, the company is revamping its international network. Fluor already sends some 350,000 electronic-mail messages a month. A project to expand use of Lotus Development Corp.'s Notes will grow the user base from its current size of 600 users to 8,000 during the next three years.

For the past two years, Fluor has been reorganizing IS to keep up with expanding business. All 50 worldwide offices now have a local IS manager reporting to corporate headquarters.

Director of information management Ken Cain maintains that IS' future success depends on its ability to use the infrastructure Fluor has built. Cain sees training as the key. "Instead of focusing on hardware costs, we need to focus on process cost, on training our people," he says.

Fluor is hoping to move to the friendlier Windows environment and recently staged an internal trade show to promote the move. Calling Windows an "enabler," Cain says he hopes to prod reluctant users to make the Windows jump by significantly expanding training.

MAPCO, Inc. 7

This diverse energy company is undertaking a major re-engineering initiative to become the most successful provider of quality energy and energy products.

During the past six months, MAPCO has dispersed development groups out to its business segments, which exceeded the firm's expectations for improved communications, according to Chris Scalet, vice president of IS. MAPCO has kept its shared services centralized on an IBM ES/9000 mainframe.

Currently, IS is developing a technology architecture and, to assist in the re-engineering initiative, has created a business process support services department comprised of re-engineering consultants. MAPCO hopes a new system in production will soon provide up-to-the-minute inventory and status information to shippers. The firm is "slowly migrating" to client/server, allowing vendors to lead with products that are demonstrated to be effective. Scalet says IS adopts only proved technology and lets vendors take care of most research and development.

MBIA, Inc. 8

The nation's leading insurer of municipal bonds is a "prudent company" in both business dealings and IS decisions, according to Jeff Kostiw, MBIA vice president and manager of information technology. As part of a broad move from Wang Laboratories, Inc. minicomputers to a client/server setup, MBIA increased its budget 17.5% this year. The IS function, which is now 90% centralized, will also be spread out during the next three years to bring development closer to users.

Among the projects on IS' plate right now are an accounting system to handle the increased volume of accounts for one cash management subsidiary and a fixed income trading desk to handle portfolio management.

With all that change, Kostiw says he has one big issue: "IT and the firm need to accelerate training."

U.S. Healthcare, Inc. 9

The IS department at U.S. Healthcare is now benefiting from a major initiative to boost its technology investment as it expands from its New England and Mid-Atlantic base into the Southeast. "Our systems hallmark is that we do not dabble in things. We do them in enterprise scale," claims CIO Richard Castor. Last year, its IS budget increased 18%, and there are 50 major development projects on the drawing board. Thirty percent of new development is in client/server.

IS has developed automated call centers to field the 18,000 customer calls the company receives daily, as well as EDI and imaging applications to handle 550,000 images a month. A new fulfillment processing automated system will answer customer information requests, store them in a database and automatically mail forms and letters. IS is also developing a practice management system to link doctors to the firm's patient tracking and billing. A new preferred treatment protocol system advises physicians on the latest effective treatment plans and provides pharmacists with drug use reviews.

Amgen, Inc. 10

The U.S.' largest biotechnology firm has to develop systems quickly to maintain its position in a hot market. The firm leads its industry in product launches and IS spending, according to Bruce Whetstone, director of corporate information technologies. He says the IS investment as a percentage of revenue has been almost double the pharmaceutical industry average.

The downside of the rapid growth is that Amgen has had little time to create a solid information architecture. "The one word that comes to mind to survive in this environment is 'nimble,'" Whetstone says. Flexibility at Amgen comes in the form of distributed systems spread across a decentralized organization. Whetstone directs half of the firm's IS efforts, including infrastructure and administrative systems, and the 12 business units each have their own computing manager. Whetstone handles major purchase requests. □

Barber is *Computerworld*'s intern.



U.S. HEALTHCARE'S RICHARD CASTOR: We do [systems] on an enterprise scale

photograph by Nick Kelsh

power of the purse

Some IS organizations are gladly **giving up** budget **control**

At Hershey Foods Corp., IS executives figure the amount of money spent on information systems outside of IS is a whopping 36% of the department's total budget.

Time was when end-user control like that would inspire terror in the minds of IS executives. But that isn't John Schniepp's attitude. "It's not necessarily undesirable," says Schniepp, who is manager of information technology technical services at Hershey Foods in Hershey, Pa.

Schniepp points out that so-called "shadow spending" often solves problems the IS department cannot address due to budgeting constraints. "Often it's a result of IS organizations not being able to bring resources to bear, so [instead] users solve the problem locally," he says.

Share the wealth

End-user IS spending as a percentage of IS budget runs the gamut at the *Premier 100*

HIGHEST 75%
H&R Block, Inc. and Avon Products, Inc.

65%
U.S. Healthcare, Inc.

63%
Advanta Corp.

Percentage of Premier 100 corporate IS spending controlled outside of IS department

AVERAGE 16%

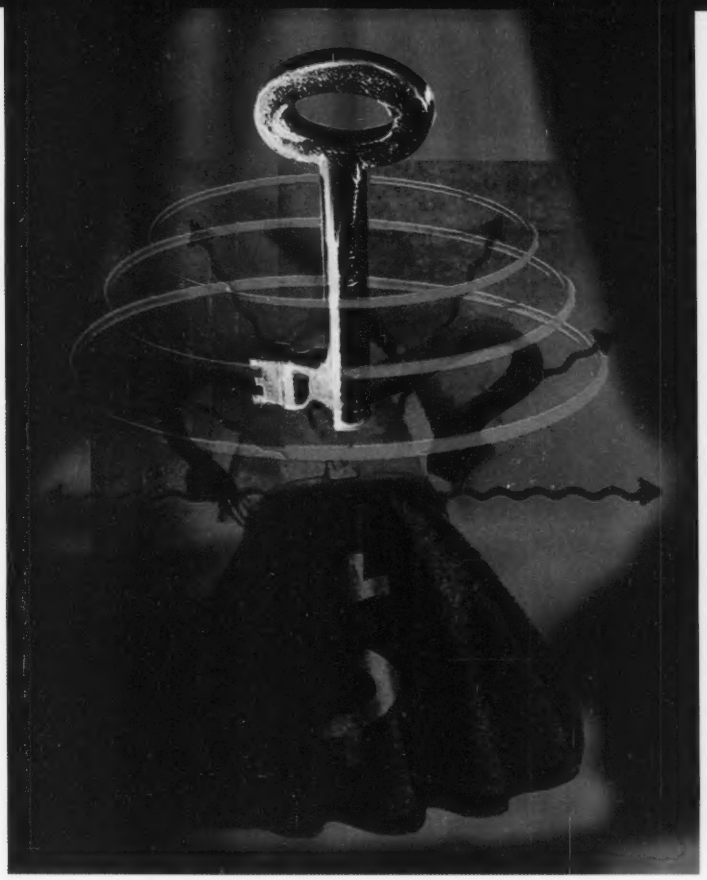
LOWEST 0%
11 companies

EVERYBODY'S DOING IT

Interviews with executives and *Premier 100* companies indicate that Schniepp's attitude is the rule rather than the exception. Shadow spending is becoming less and less of a panic button for top IS managers.

"It's an issue, but it's not even in my Top 10. I'm not going to go around the company, beat people up and say, 'Gimme that back,' " says Bruce Whetstone, director of corporate information technologies at biotech firm Amgen, Inc.

BY DEREK SLATER



That relatively relaxed attitude is a change from even the recent past. Shadow spending has been a pressing concern for IS executives ever since the PC started sneaking onto corporate desktops a decade ago.

"It's a continuation of a long-standing issue," says Donald Broutman, a New York-based consultant at Seer Technologies, Inc. "It used to just be a small number of users."

IS HEADACHES

The basic problem is that when users start rolling their own systems, IS has to concern itself with compatibility and support issues. Another headache is the task of keeping multiple copies of corporate data synchronized.

"It does open the door to anarchy," Broutman says.

And shadow spending is clearly going nowhere but up. A recent study of 250 Fortune 1,000 companies by Dataquest, Inc. in San Jose, Calif., found that shadow spending in user departments averages about 25% of the IS budget and reaches 60% or more in some cases.

IS managers say PCs and PC software account for the vast majority of end-user technology spending. Other factors include the move to distributed computing architectures, the explosion of non-IS personnel having computer expertise and ever easier availability of software.

IS managers say all this end-user spending is not confined to a few likely suspects; it is springing up in all sectors of the corporation. Marketing and accounting departments are buying their own systems for business intelligence analysis, while engineering and research arms often build high-powered systems for tasks such as modeling or transaction processing.

Companies with extensive overseas operations have even less control over end-user spending.

Stu Dammeyer, head of North American IS operations at Reader's Digest Association, Inc. in Pleasantville, N.Y., has a fairly easy time keeping tabs on IS purchases because operations are consolidated into a single facility.

However, Dammeyer says, "We report to one person in charge of all global [information technology] decisions. If you ask him if anyone ever snuck anything into Stuttgart, you can predict the answer: Of course."

OLD MODELS OUTMODED

All these factors mean that IS must adapt, not fight.

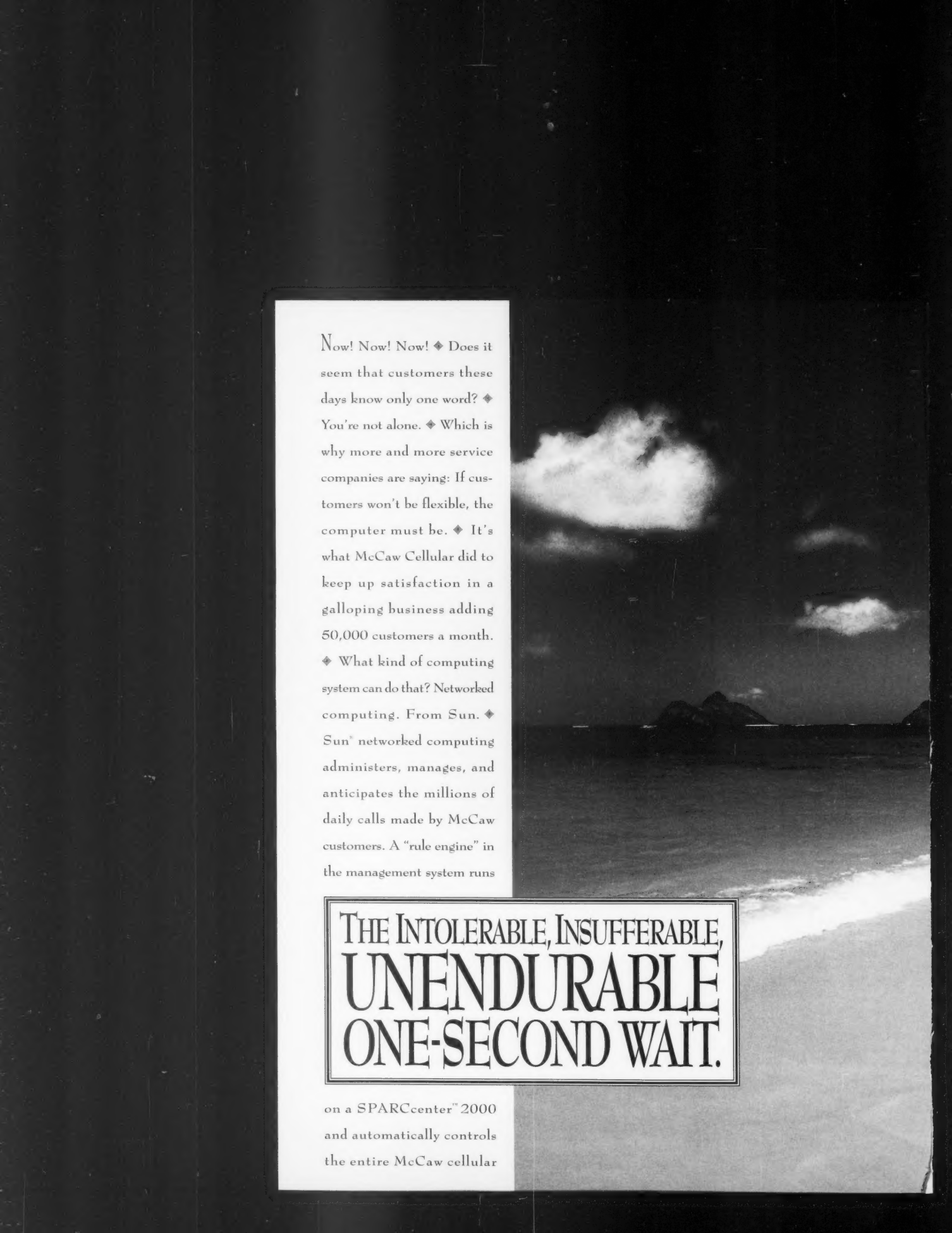
"Five or 10 years ago, we thought we could control everything. But now there's no way in heck to keep it all under one umbrella, so you might as well give up and find another way to cope," Amgen's Whetstone says.

Whetstone says two approaches have evolved to replace the old "command and control" model as IS forms partnerships with end users.

Some IS departments are molding themselves into service-oriented organizations, making themselves the best possible source for technical support

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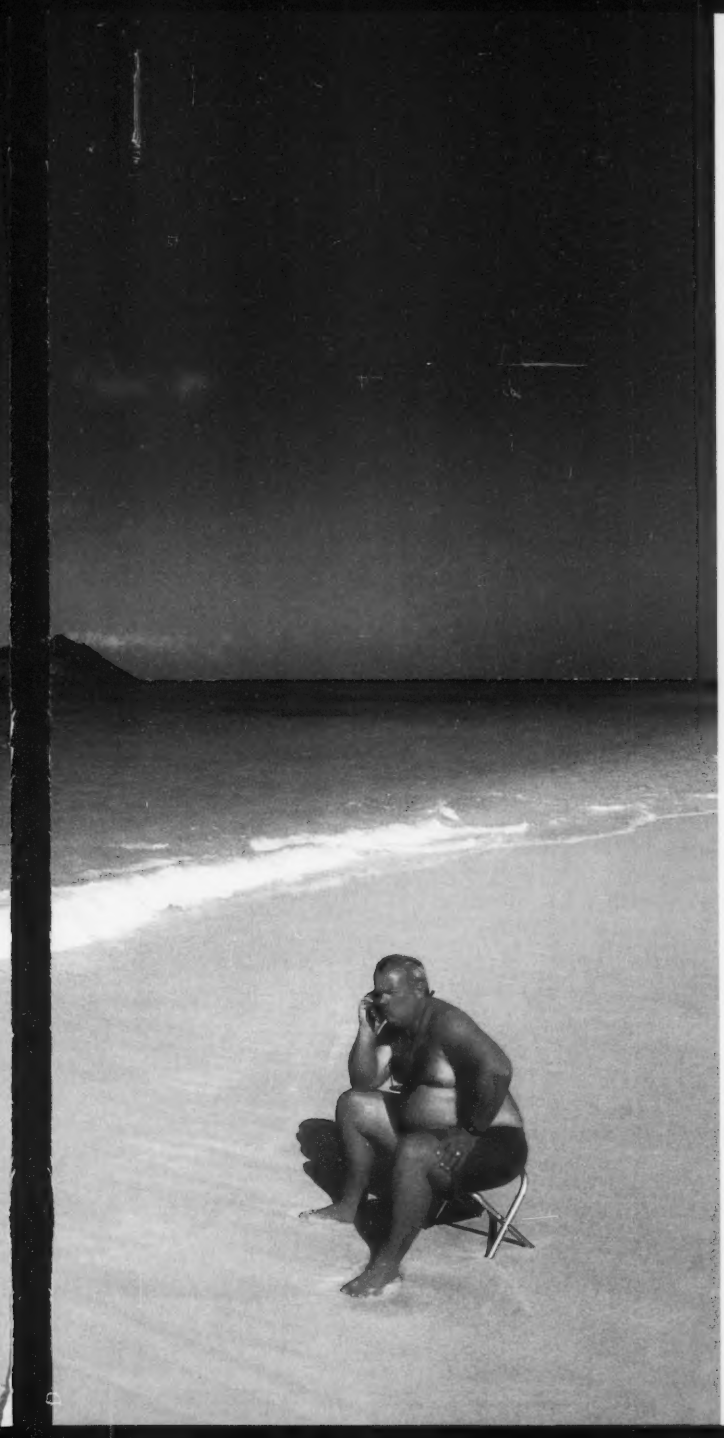
Illustration by JENNIFER JESSE



Now! Now! Now! ◆ Does it seem that customers these days know only one word? ◆ You're not alone. ◆ Which is why more and more service companies are saying: If customers won't be flexible, the computer must be. ◆ It's what McCaw Cellular did to keep up satisfaction in a galloping business adding 50,000 customers a month. ◆ What kind of computing system can do that? Networked computing. From Sun. ◆ Sun® networked computing administers, manages, and anticipates the millions of daily calls made by McCaw customers. A "rule engine" in the management system runs

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on a SPARCcenter™ 2000 and automatically controls the entire McCaw cellular



network. ◆ Data that used to come in printouts as tall as a man, now come in easy-to-see, easy-to-analyze information that is automatically sorted, coded, and shared with teams in 35 locations across the country. ◆ And the power of the Sun system can be matched to the growing demands of the network simply and easily. Plugging in CPU boards to the SPARCcenter 2000 quickly upgrades performance. ◆ There's more to the story, of course. Cost savings. Service and support. But, hey, that's what phones are for: 1-800-426-5321, ext. 695. ◆ More than 135,000 organizations are using Sun systems, powered by the SPARC® chip and the Solaris™ software environment, to gain a competitive advantage. For more information, use the Internet to access Sun's World Wide Web server at http://www.sun.com/

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for end users who control the purse strings.

For example, McDonald's Corp.'s computing is centralized, with perhaps 95% of all hardware and 80% of all software purchases approved by IS.

However, according to Carl Dill Jr., vice president of IS, the company is not sitting back on its heels waiting for shadow spending to take off. "We're being proactive with [shadow spending] rather than trying to police it," he says.

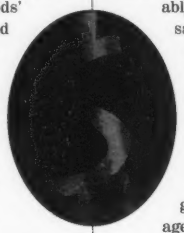
The Oak Brook, Ill.-based fast-food chain is working to implement a client/server environment that will attract end users by providing all the functionality they need. "When we have a robust environment for them to log on to, there's very little incentive for them to go in another direction," Dill says.

While the new system will put more computing power on users' desktops, it will also automate common control functions such as backup, which users tend to neglect.

Similarly, IS managers at Hershey Foods prefer education and persuasion to enforcement.

The company has procedures in place that could permit a nearly complete crackdown on end-user technology spending: Every purchase — including PCs — must get IS approval.

However, "Pragmatically, it makes [more] sense to put forth business reasons" for complying with IS preferences, Hershey Foods' Schniepp says. "We have had situations where users have decided on a product that we don't support. In some cases we've persuaded them to stick with our product, and in some cases we haven't," he says.



SUPPLEMENTAL SPENDING

The other response to shadow spending that some *Premier 100* companies have adopted is to supplement the IS budget and aggressively introduce new technologies in the corporation.

Salomon Brothers, Inc. actively uses shadow spending to alleviate pressure on the IS budget. The financial services firm reports a 50% shadow spending rate; as Salomon pushes new technologies out to the users, the costs are passed along as well.

Jill Nathanson, vice president at Salomon, explains that as the company moves to distributed computing, each department must assume budget responsibility for its own servers and PCs.

Rather than fighting the expense, user departments have responded favorably to the accountability, she says. "They feel like they are getting only their own costs" instead of helping shoulder the burden of other departments' computing needs, Nathanson says.

Salomon's central IS group still handles all management issues and purchases all networking equipment to ensure companywide compatibility.

WILLING TO PAY

End users at other companies are equally willing to shoulder greater cost when it is accompanied by decision-making power.

Sonoco Products Co. has moved all purchasing authority and expense out to the user groups, creating "an internal market economy" in which users can choose either IS or an external service provider.

Brian Westphal, a financial analyst at Sonoco, says the change has been well-received because it allows his department to calculate more exactly the cost of working with IS. "I think it has increased the level of service as well, since they are competing with outside groups," he notes.

All in all, the shadow spending issue seems to be maturing. Rising departmental spending among *Premier 100* companies now goes hand in hand with increased cooperation between IS and user departments.

"In many cases, it ties into IS departmental projects," Dammeyer says of shadow spending at Reader's Digest. In such instances, shadow spending "is more an accounting preference," he says. "It certainly isn't hidden from IS." □

Slater is a free-lance writer based in Ashland, Mass.

"**Five** or **10** years ago we **thought** we could **control** everything.

But **now** there's **no way** to **keep** it all **under** one umbrella."

BRUCE WHETSTONE
AMGEN, INC.

in Person

rocket man

Rockwell International's **James Sutter** finds hard times in the defense business spark productivity innovation

"Information technology is becoming very much **focused**, at least in our **company,** on the external **world."**

BY CRAIG STEDMAN

James F. Sutter has been vice president and general manager of information systems at Rockwell International Corp. in Seal Beach, Calif., since July 1983. Rockwell earned $561.9 million on revenue of $10.8 billion in the fiscal year that ended in September 1993. Its annual IS budget is about $400 million.

CW How critical is IS productivity to Rockwell's business strategy?
SUTTER It's a particularly key part, given the changes in our industry. In the defense and aerospace sectors of the company, we've had some dramatic downsizing and increased emphasis on productivity. . . . The era where there was a lot of growth in the defense and space budgets is over, and that's a compelling driver that insists we have a high level of [IS] productivity.

CW What steps have you taken to improve productivity?
SUTTER Like a lot of large companies, we consolidated to a single data center, and the productivity yield was very dramatic. In the last couple of years, we've dropped our number of operations people by half. We've also attacked many of the things we do with automated software products. And I've been very pleased with what has been achieved in negotiating better terms with our information technology suppliers.

CW Are you seeing a payback?
SUTTER Our overall IS budget has come down slightly. It's $400 million total now, and it peaked at about $430 million. Investments on the desktop and in servers and LANs and people to support all that have in many ways offset the improvements in productivity that we've made. The major benefit has been [the ability] to reallocate the resources we apply to information technology to areas that are new. We're also giving our field force tools that allow them to link into their customers directly. To be able to fund those [projects] out of productivity improvements is vital.

CW Are the metrics that you use to measure the value of your IS investment changing as you put in client/server systems?
SUTTER That's probably the area that's hardest for senior management to get comfortable with. We have for many years benchmarked ourselves against other companies in the area of what it's costing us in the computing center for the amount of utilization of our mainframes. But if you get into software or LANs, it gets more gray. There are so many part-time participants who use a LAN that it's difficult to measure productivity.

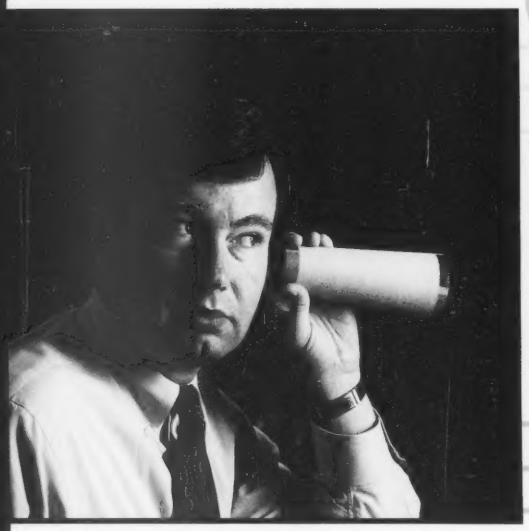
CW Given the [industry] changes, is this a good time to be in IS?
SUTTER Businesses are dependent on information technology much more now, and they need good direction. Is it as much fun? I think those of us who have been in the business a long time have to get used to the fact that we will not have as much of a hands-on role, and we have to adapt. □



JAMES SUTTER: 'To be able to fund . . . projects out of productivity improvements is vital'

photograph by ALAN LEVENSON

get



SUNOCO'S TIM KAHN: EDI 'has been slow to catch on because people see it as more complex than it is'

In the Southeastern U.S., where Tulsa, Okla.-based Mapco operates a chain of convenience stores and offices, BellSouth Corp. has been Mapco's communications supplier of choice for several years.

"We do a tremendous volume with them," says Chris Scalet, vice president of information systems at the $3 billion Mapco.

And with that tremendous volume comes a tremendous amount of paperwork.

"We got reams and boxes of paper from [BellSouth] every month. Somebody had to go through all of that," Scalet says.

Recently, however, an electronic data interchange (EDI)-based re-engineering project has linked Mapco's accounting system and BellSouth's billing.

Mapco can now better analyze its communications costs and "get our people costs out of the transaction processing business and into more decision support," Scalet says. "Instead of having accounts payable clerks doing data entry, we can have them reviewing invoices and looking for irregularities and problems."

LINK UP

Mapco, like many other *Premier 100* companies, is discovering the benefits of linking to the outside world. Whether it is running complex EDI transactions or just exchanging electronic mail with suppliers and customers, electronic communications is an increasingly popular route to reducing personnel costs and better integrating information into existing information systems.

The average *Premier 100* company has 20% of its workstations connected to suppliers or customers. For some companies, particularly in the financial services industry, linkage approaches 100%.

BY AVERY JENKINS

Most of the users who were interviewed say they are growing the number of connected users but carefully. Cost and security concerns frighten some business partners, and the cost benefits of EDI in particular can be hard to calculate. IS managers point out that connecting electronically to customers can often be more expensive than maintaining the old paper-based system.

But don't look to savings on postage as

connected

the benefit of electronic linkups, they say. The big payoff is in improvements in speed, efficiency and error reduction.

"It's not a quick fix," says Roxanne Reeves, manager of the electronic commerce program at Input, a market research firm in Mountain View, Calif.

She says that to properly implement EDI, a company must be willing to change its business processes and re-engineer core applications to effectively employ EDI.

While some EDI vendors are pressing the case for EDI as an add-on to existing applications, Reeves says that approach will probably yield few, if any, benefits.

Mapco's Scalet agrees. Simply tacking an EDI front or back end on to an existing process can double the cost of transmitting the transaction, he says.

Re-engineering is a central part of Mapco's adoption of EDI. The company is currently re-engineering its data collection systems at its convenience stores to streamline and manage the flow of data from point-of-sale collection to the decision makers.

Scalet says that by moving the labor costs from transaction processing to decision support, Mapco was to free up enough manpower to justify the added per-transaction cost.

THE ADVANTAGE OF LINKS

And sometimes there's a bigger incentive for adopting electronic commerce: competitive advantage.

Electronic links to customers are "a competitive necessity" in Thiokol Corp.'s commercial business, according to Brad Stout, Thiokol's chief information officer. For example, Thiokol's $175 million Huck Manufacturing Division uses a

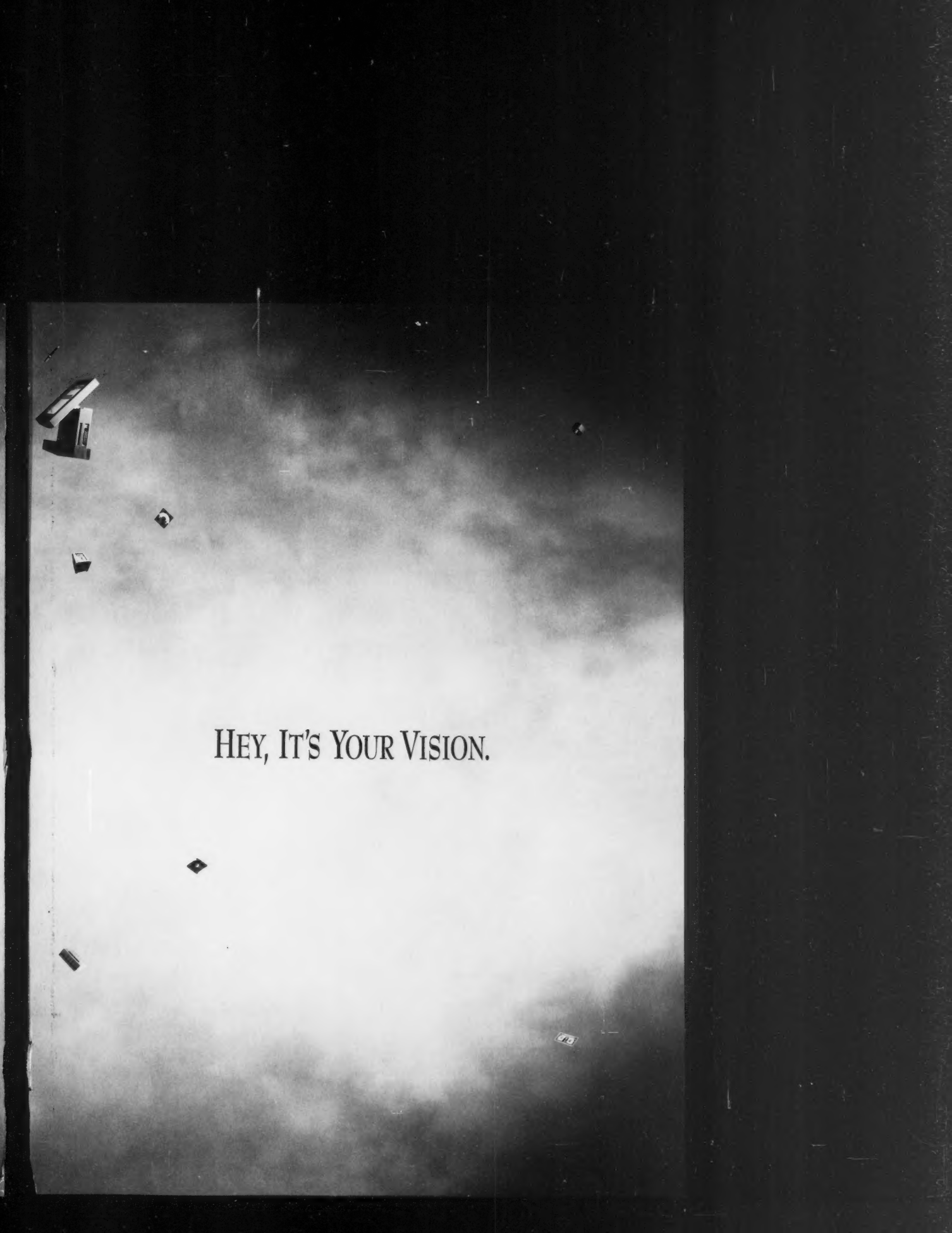
continued on page 32



SUNOCO'S VERN MYERS: 'We see EDI as a key enabling technology for improving our overall logistics processes'

Links between **customers** and **suppliers** are building **virtual** corporations of the **future**

photographs by WILLIAM MCINTYRE


HEY, IT'S YOUR VISION.



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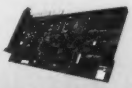
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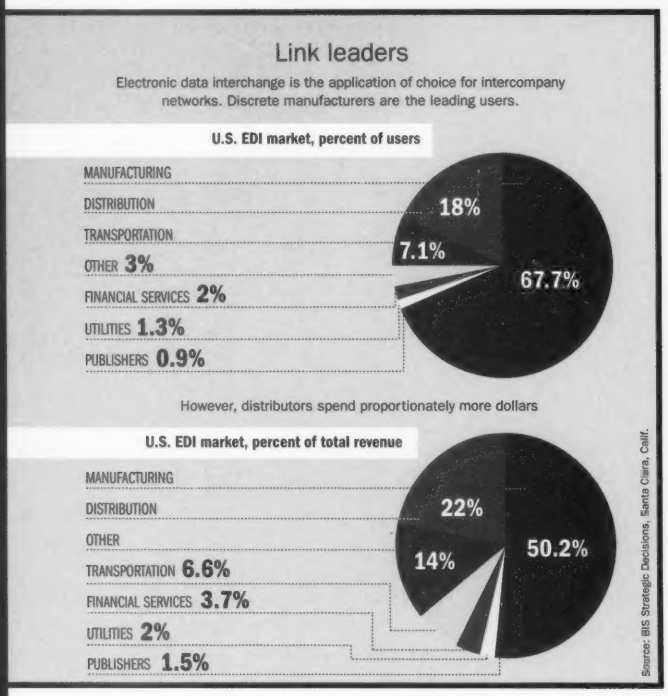


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Sun

The Network Is The Computer

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continued from page 27

just-in-time delivery system to get products to its customers.

"We got our big payoff when we integrated incoming orders onto our order management system," says Harold Borne, vice president of IS at Huck in Irvine, Calif.

Incoming EDI orders are sent to Huck's PC-based EDI translator and from there are uploaded to a minicomputer-based order-entry system. Only at that point do people come into the picture for order approval. Data entry has been virtually eliminated, and Huck is now able to fill orders faster and with less chance of error.

The system has allowed Huck to increase the number of orders it processes without increasing staff size, Borne says. More importantly, he adds, the project has satisfied Huck's drive to be easier to do business with than its competitors.

But EDI is not a panacea. Some business partners fear the technology will create security problems. Others simply don't want to spend the time and effort to learn and support it.

Greensboro, N.C.-based textile manufacturer Unifi, Inc. now manages the paperwork associated with 95% of its inbound supplies and 40% of its outbound fibers through EDI. But some of its business partners just won't use the system for security reasons, according to Jerry Moore, vice president of MIS.

Then there are the cost barriers. "Some of our smaller customers could not afford" the cost of implementing their own EDI connections, Moore says. So Unifi doesn't force the issue. "It's available, but we aren't going out and aggressively pushing it," he says.

In addition, users say EDI is difficult to justify on paper savings alone. The big payoff comes in manpower reduction and improved integration of billing information into corporate order entry, billing and accounts payable systems.

Sonoco Products Co. in Hartsville, S.C., has recently incorporated EDI into its bills of lading and payment processes to reduce labor-intensive accounting. Today, savings amount to 70 cents or 80 cents per document, or $40,000 per year, through EDI, according to Tim Kahn, Sonoco's manager of EDI.

Adds Vern Myers, corporate global traffic manager, "We see EDI as a key enabling technology for improving our overall logistics processes."

Unifi's Moore says, "I have two people processing $750 million in invoices per year."

PART OF DOING BUSINESS

In some industries, electronic customer linkups are simply a way of life. A big portion of The Bear Stearns Cos.' business is clearing trades for some 1,600 other trading firms. Customers download their files, and Bear Stearns handles the clearing process.

"In the volumes we handle, the only way we could do it is electronically," says Ben Kuenemann, senior managing director of information services.

Bear Stearns has profited from taking the in-house system it developed to clear trades and making it available to other traders.

Yet despite the inherent difficulties — political, financial and technological — these users say the migration to EDI is worth the effort.

"EDI is like a little piece of cheese in a sandwich," Input's Reeves says. "You may not see it, but without it things aren't going to work."

"It has tremendous benefits, but it's been slow to catch on because people see it as more complex than it is," Sonoco's Kahn says.

"We see EDI as not an end in itself but as a way to facilitate strategic partnerships," Thiokol's Stout says. "We have more and more alliances where EDI is going to be an integral part of that relationship." □

Jenkins is a free-lance writer based in Ansonia, Conn.

in Person

bullish on technology

Merrill Lynch's **Howard Sorgen** keeps investment firm's eye on the ball

"There's never been a more **challenging** time or more **opportunities** to do good things in **delivering technology."**

BY CRAIG STEDMAN

Howard P. Sorgen, 55, is senior vice president and managing director of global systems and technology at Merrill Lynch & Co. in New York, which earned a $1.4 billion profit on net revenue of $10.6 billion last year. Its annual information systems budget is about $900 million.

CW You've consolidated 11 data centers into two in recent years. What else have you done to improve IS productivity?

SORGEN We standardized software [across operations], so between both the physical and logical consolidations we tore out a lot of facilities and removed 40% of the work force in the host-based processing environment. We also took all of the application development people responsible for host-based production systems and put them in one central group. That's dramatically reduced the cost of maintaining the production systems as well.

CW You also centralized other parts of IS to regain control over the cost of departmental projects. Is that working?

SORGEN A year ago, we took all of the groups that were dedicated to developing applications for specific business units and put them together. . . . In effect, we've gone back to basics. We're now heavily centralized. The cost savings has been that we don't have to build utility-type functions for individual units. We operate from a common pool.

CW How much money have you saved with all the changes?

SORGEN I would look at it more from a reinvestment standpoint than a pure reduction. We saw that we were going to migrate to client/server platforms and felt it was incumbent on us to self-fund part of that investment by reducing the cost of the host-based processing environment. We actually reduced our [mainframe] cost base 45%, but we reinvested [about half] of that into client/server.

CW Your IS head count has come down from about 3,000 to 2,100. Are more reductions planned?

SORGEN Actually, we see that number going up before it comes down. We're rolling out more and more [client/server] applications as we speak, and human resources to support that are an ongoing need. But the budget is likely to remain flat as we rip out infrastructure. We need continuing cost reductions, so we don't go hog-wild as a percentage of revenues.

CW Is this a good time to be in IS?

SORGEN I think there's never been a more challenging time or more opportunities to do good things in delivering technology. But I've seen a lot of trepidation on the part of CIOs. A lot of CIOs have accepted caretaker situations and been reluctant to step up to the plate and do the job they're supposed to do, [which is] to manage applications development and deliver those to your customers. They become a "facilitator," or something like that. Those words mean nothing to me. They don't accomplish anything. □



HOWARD SORGEN: 'We've gone back to basics'

photograph by JOHN RAE



CIO JAMES MARSTON AND CEO JOHN LILLIE of American President Cos. occupy cubicles on the re-engi neering front lines

Talk about close: When James S. Marston wants to talk with his boss, he needn't trudge to the executive suite or call days ahead for an appointment.

Instead, Marston, chief information officer at Oakland, Calif.-based American President Cos., walks a few steps and sticks his head into a nearby cubicle.

"I've been spending three or four hours a day down here with the re-engineering team," says John A. Lillie, chairman and chief executive officer. The $2.6 billion international transport company is redesigning its entire business, from order entry to service. "Jim and I sit close together."

What's this? Top executives and CIOs as cube neighbors? Aren't most CEO/CIO relationships more like king and royal alchemist — an arm's-length mix of mutual dependency, suspicion and bewilderment? Not if you look at this year's *Premier 100*.

Some of the fastest-growing, most innovative (and profitable) global companies feature cheek-to-cheek partnerships between the information systems head and the big boss.

Whether such a setup thrills you or terrifies you is another matter. But those involved say the arrangement works smashingly. Drawing IS into the inner circle, they say, can reduce miscommunication, improve credibility and alignment for IS and, ultimately, boost the bottom line.

"We regard technology as an opportunity to gain competitive advantage," Lillie says of his 6,000-employee firm. Marston sits on the company's executive committee alongside five other top operating and administrative executives.

How do these happy couples not only avoid bites and burns but also steer some of the nation's most technology-savvy companies?

• **The right environment.** Before they can stay close, executive partners must get close. Often, that means a flat company in an information-intense industry such as finance, health care or transportation.

Company culture must also be right. Take Nalco Chemical Co., a

Knowing who's boss

Here's a sampling of *Premier 100* companies in which the CIO reports to the top boss.

American President Cos., RANK 44
James S. Marston, Senior V.P. & CIO
John M. Lillie, Chairman, CEO & President

First Virginia Banks, Inc., RANK 85
Shirley C. Beavers Jr., President
Robert H. Zolokar, Chairman & CEO

GEICO Corp., RANK 38
Simone J. Pace, Senior V.P. & CIO
O. M. Nicely, CEO

H&R Block, Inc., RANK 45
Judy Keisling, V.P., Information Services
Harry Buckley, President & CEO

IDS Financial Corp., RANK 73
Jack Thomas, Senior V.P., Information & Technology
Dave Hubers, CEO

Johnson & Johnson, RANK 51
Ronald Morris, V.P., Information Technology
Ralph Larsen, Chairman & CEO

MBNA Corp., RANK 83
Ronald W. Davies, Vice Chairman & CTO
Charles M. Cawley, Chairman & CEO

Merrill Lynch & Co., RANK 29
Edward L. Goldberg, Executive V.P.
Daniel P. Tully, Chairman & CEO

Reader's Digest Association, Inc., RANK 93
Kenneth A. Nelson, V.P., MIS
James P. Schadt, COO/CEO

Tribune Co., RANK 92
John Kazik, Senior V.P., Information Systems
Charles Brumbeck, Chairman & CEO

United Healthcare Corp., RANK 49
James P. Bradley, Senior V.P. & CIO
William McGuire, CEO

happy together

These **lucky CIOs** report **directly** to the **top** boss. But **success** requires **poise and personality.**

BY JOSEPH MAGLITTA

$1.5 billion specialty manufacturer in Naperville, Ill. A quality program begun in 1987 "has encouraged much more open communication," says CEO Edward "Ted" Mooney.

Mooney credits quality "culture" with opening channels between IS and top management, sales, marketing and research and enabling a $10 million effort to equip 2,000 Nalco sales representatives worldwide with a laptop-based analytical system.

The approach seems to work: Mooney and David R. Bertran, Nalco's senior vice president of manufacturing, logistics and IS, last year won the prestigious Society for Information Management "Partners In Leadership" award for outstanding teamwork. (JC Penney Co. was a co-winner.)

• **Common ground.** Whether it's technically astute CEOs or IS chiefs with business credits and training, top partnerships require some meeting in the middle.

Kenneth A. Nelson, vice president of MIS at Reader's Digest Association, Inc., rose through the technical ranks at Mars, Inc. and eventually ran a business unit worth "several hundred million."

Since 1991, he has worked alongside Reader's Digest CEO James P. Schadt at the $4.5 billion global publisher. Nelson calls the technology shots on a massive global database of 100 million names — a key strategic asset for the Pleasantville, N.Y., company. "I'm always thinking very much as a business manager," he says.

Similarly, James P. Bradley headed a large health maintenance unit for Aetna Life and Casualty Co. before becoming senior vice president and CIO at United Healthcare Corp. "If you don't know the fundamental drivers, you limit your effectiveness and thus your relationship with the CEO," he says.

On the flip side, it doesn't hurt to have a boss who's not tech-shy. Take American President's Lillie: In the 1960s, he programmed punch cards at Boise Cascade Corp. Today he uses electronic mail and Microsoft Corp.'s Word and likes to tinker with a Macintosh multimedia computer at home.

"An employee once referred to me as a hacker," he says proudly.

• **Good personal fit.** The right resume and culture can get you onto the executive committee. But what if you're a dud?

"With a good personal fit, you could be down a notch or two in the organization and still be effective," Marston says.

But it doesn't hurt to be a bit cheeky. "I can't tell you [CEO William E. Guire] and I don't argue," Bradley admits. "I've always found it easier to ask forgiveness than permission."

And surprise: Tight CEO/CIO teams often seem less concerned with strict return on investment. How technology will advance business goals is often a bigger concern. Gut feel isn't unheard of.

"What got us from $1 billion to $5 billion in annual sales in five years wasn't a bureaucratic capital expenditure committee," Bradley says.

While CEOs and CIOs say drawbacks to tight partnerships are few, they don't ensure perpetual technological bliss. For example, Nalco's initial laptop pilot flopped. Problem: Reps hated the canned software.

In addition, highly-placed IS heads still must gain the respect of other top managers. And that, they say, can be tougher than currying the boss' favor.

"You can be well-positioned in the organization," American President's Marston says. "But if you can't work yourself into the confidence of senior people, you don't have a chance to survive. They can shut you out with the speed of light." □

Maglitta is Computerworld's *senior editor, Corporate Strategies.*

photograph by WILLIAM MCLEOD

in Person

IS in his genes

A hands-off approach helps Amgen CEO Gordon Binder turn molecules into money

BY JOSEPH MAGLITTA

At Amgen, Inc., the nation's largest independent biotechnology company, Macintosh computers outnumber employees: 3,600 vs. 3,000. "Amgen runs on PCs," says Chairman and Chief Executive Officer Gordon Binder.

Indeed, the Thousand Oaks, Calif., company lives or dies on technology. Amgen scientists use molecular biology and state-of-the-art systems to create highly specialized health care products. Its biggest sellers — an anemia fighter called Epogen and Neopegen, an anti-infection agent — were created using sophisticated recombinant DNA techniques.

Since Binder became CEO in 1988, Amgen's annual revenue has shot from $200 million to $1.3 billion. Net income has tripled. Amgen now boasts offices in North America, Australia, Japan, Europe and Hong Kong.

CW Many of your CEO peers are pretty skeptical about technology boosting productivity. You, too?

BINDER Ten years ago, if you walked through one of our labs, you'd see scientists at benches running experiments. If you walk through one of our labs today, you'll see pieces of scientific equipment hooked to a PC, chugging away, while the scientist is away researching data. A lot of this stuff can run all night long. Information technology certainly improves productivity for us.

CW How?

BINDER Nobody makes a mistake entering data, for instance, because statistical analysis programs make the charts. And we have over 24 buildings here, so we save a lot of walking between.

CW Most CEOs also swear that technology is pivotal to business. Is that true for Amgen? Why?

BINDER We have thousands of patients in clinical trials; all sorts of data is collected on each one. Each of these pieces of data has to be analyzed and reconciled and reported to the FDA. We couldn't begin to do that without computers.

CW What's your approach to corporate technology use?

BINDER Even before I joined Amgen in 1982 . . . it was clear that the cost of hardware was coming down rapidly and the cost of software was going up. Information technology salaries were also rising. So the idea of picking the hardware first — and in doing so making the more expensive people and software inefficient — struck me as funny.

CW How is that philosophy played out at Amgen today?

BINDER From the very beginning, each major area of the company has had the freedom and finances to acquire and run its own hardware and software. We say: "Get what you want and need." The marketing department, for example, can spend more on ads or the sales force or information technology. It's up to them.

CW How does Amgen judge if an IS project is worth the money?

photo illustration by M.A.D.

BINDER We have case-by-case guidelines. A lot of [return on investment] calculations are pretty off. How do you measure improved sales force productivity? I find if the salespeople thought it was great and the national sales manager thought it was great, it probably is great.

CW That's a lot of power for business departments. How has it worked out?

BINDER It varies from group to group. If a function head is very information technology-oriented and very aggressive, they will have a very sophisticated information technology setup. The weaker ones need more help.

CW You have a chief information officer and a 70-person corporate IS function. Where do they fit in?

BINDER [CIO Bruce D. Whetstone] installs systems and gets them running but without ownership. Bruce provides [air-conditioning], fiber cable, interoperability and connectivity for remote sites and overseas operations. He also has major training responsibility.

CW How do you see your role in IS? The CIO's?

BINDER We make it easy for people to run the major departments. Our roles are quite often the same: We deal with very basic policy issues, very broad guidelines. It's up to Bruce [Whetstone] to get new tech opportunities to all the people and to pour cold water on fancy new ideas that don't make any business sense. Computer security is a special hot button I get involved in.

CW You're the leading firm in a young industry that has no IS tradition or legendary systems. Does that help or hinder?

BINDER I'm not sure we've gotten any real benefit from the information technology tradition. We tend to be pioneers rather than copiers. We've built our infrastructure from the ground up.

CW How does company culture impact IS?

BINDER We tend to be very science-oriented in everything we do. We think everybody in the company can run experiments, not just people in the labs. Information technology experiments are built into the culture. We're also a company full of relatively young people who are receptive to new things.

"If the head of **accounting** came to me and said he **didn't have** the **software** he needed, I'd say **'Why don't you get it?'** End of meeting."

CW Are you a techno-fan, technophobe or something in between?

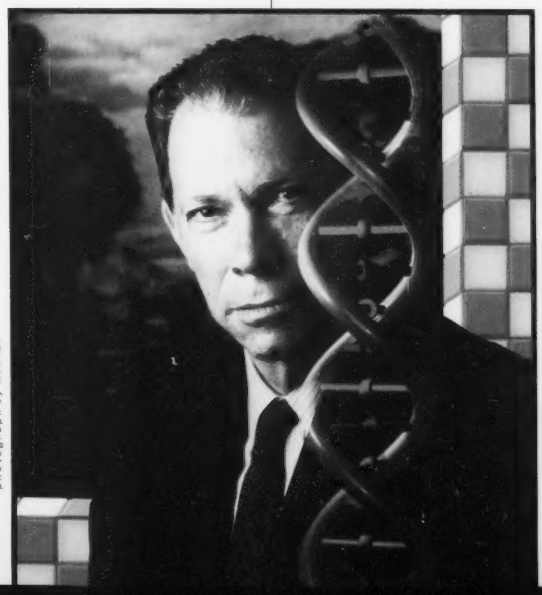
BINDER I'm really not a technology user. I see things better on pieces of paper, even though some come out of a computer. I look to put notes on these [sheets] in the margins and send them back. Plus, I travel a lot. It doesn't make as much sense for my particular work.

CW You've been in business since 1957. Any areas where computing professionals consistently don't get it?

BINDER I guess my biggest criticism is that some information technology people weren't user-friendly. They tended to have their own agenda more than they should. They're not as service-oriented as they should be.

CW The notion that IS can provide a competitive edge has suffered recently. Do you agree?

BINDER Increased productivity is a competitive advantage. It takes eight to 10 years to get a molecule to market. Every time we knock off another day, we have a better chance of being the first to get a patent to market. That can mean the difference between a lot of sales and no sales. □



photograph by M.A.D.

Maglitta is Computerworld*'s senior editor, Corporate Strategies.*

premier 100 Survey

feelin' groovy

Budget and user pressures aside, Premier 100 IS departments are a confident group

Premier 100 information systems departments are learning to live under a microscope. Our annual survey of the Premier 100 demonstrates clearly that corporate management is watching IS groups more closely than ever. Increasing demands from the user community, tighter budgets and the need to cost-justify project investments are forcing IS departments to put up or shut up. Fortunately, most believe they're doing a pretty good job of putting up.

"Over the last several years, our back office is probably handling two to three times the volume of trades with 75% of the people," says W. Ben Kuenemann, senior managing director of information services at The Bear Stearns Cos. in Whippany, N.J. "That's got to mean something."

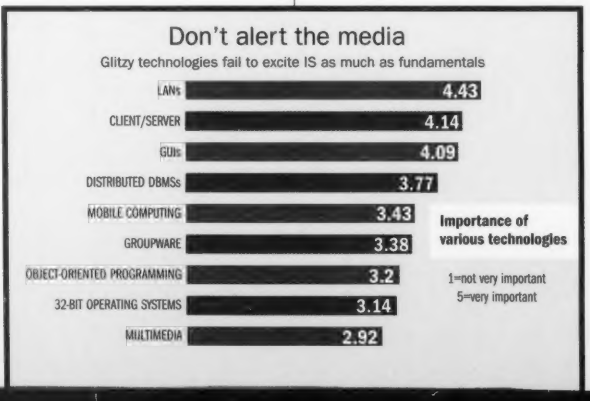
What it means is that *Premier 100* CIOs are confident that the productive value of the IS investment is tangible, but they expect benefits to show up in business results. Just spending money on computers isn't enough. The executives are inclined to experiment more with organizational changes than with technology, moving their people closer to the business units and forcing more decisions out to the end users rather than hard-coding the information flows that already exist. They are also inclined to look at outsourcing as a strategic option rather than as a political threat.

The *Premier 100* companies are also a pretty cost-conscious group, judging by their approach to cost justification. Fully 95% of the respondents said return on investment (ROI) measures are very important or somewhat important to getting a project through the corporate approval cycle.

"We do an ROI on every project," says Patrick Zilvitis, vice president of corporate information technology at Gillette Co. "Our whole [information technology] strategy is to support the business strategy and improve value to shareholders."

SKY'S THE LIMIT

However, Zilvitis, like other managers, says Gillette is not pinching pennies when it comes to projects with big potential strategic payoffs. Other *Premier 100* executives agree. When we

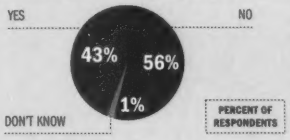


BY PAUL GILLIN

Reinventing IS

Pressure to perform is pushing groups to realign themselves . . .

Has your IS department been altered to better align with business needs?



. . . but along very different lines

How has the structure of your IS department been altered during the past year?



Source: *Premier 100* survey

asked what management attitudes were toward IS investments, seven out of 10 executives said management is investing, although generally with cost-justification criteria. Only four of the companies said management is in an active cost-reduction mode.

PAYOFF TIME

And they clearly believe the payoff of that investment is emerging. Asked whether spending on IS is enhancing white-collar productivity, 93 of the 99 people who answered the question said yes.

One reason the benefits may be showing up is an intensified focus on revamping business processes through IS instead of just automating what's there.

The survey results indicate that the re-engineering phenomenon is catching fire, with 74% of the respondents saying they had re-engineered or redesigned some business processes in the past year to exploit technology. Sales and marketing functions are the beneficiaries of the bulk of that effort. Fully half the *Premier 100* are involved in some kind of sales and marketing retooling.

That's in line with the new image of IS as a product line developer, according to Thornton May, vice president of research and education at Cambridge Technology Partners in Cambridge, Mass. "Your old-line CIO was basically somebody who managed budgets effectively," he says. "You're now putting in place an entrepreneur who can grow the business."

APPEASING TOP BRASS

The results testify to the importance of satisfying top management. While the majority of the survey respondents said scrutiny of IS by top management and shareholders had not changed during the past year, a sizable minority (40%) said it had increased. Only four of the 100 respondents said the pressure had lessened.

However, increasing scrutiny is a half-empty/half-full proposition.

Some IS managers relish the idea of top management attention because it allows them to show off the value they can add to the business. "Senior management feels strongly that technology is important to move forward," says John Kazik, senior vice president at Tribune Co. in Chicago.

IS groups are also reorganizing themselves, but there's hardly agreement among them on which way to go. Forty-three percent of the groups have undergone some kind of organizational change in the past year to better respond to business needs.

Of those who have rejiggered, nearly a third have been distributed into the business units. However, nearly one in five has actually been recentralized to achieve economies of scale and to cut costs.

The contradiction may reflect the push/pull many IS departments are facing today: Get closer to the users but do more for less money.

Gillette's IS group is one of those that's spreading out to get closer to the customers. Many of the IS staffers now report directly into discrete business units with dotted-line responsibility to a central function, Zilvitis says.

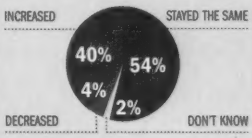
"My staff has diminished considerably, but the function is now spread throughout the company so we all work together," he says. "In these days of self-empowered teams, you no longer can judge your position by how many people directly report to you." □

Gillin is Computerworld*'s editor.*

Best behavior

IS departments are under the microscope

During the past year do you believe that the degree of scrutiny of IS by management and shareholders has increased, decreased or stayed the same?



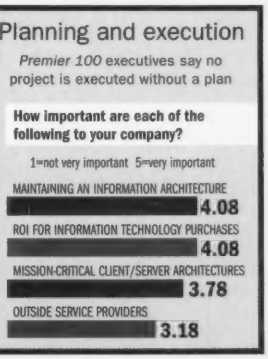
Source: *Premier 100* survey

Planning and execution

Premier 100 executives say no project is executed without a plan

How important are each of the following to your company?

1=not very important 5=very important



star performers

In the **IS productivity game,** these players **finish** well **ahead** of their peers

BY KIM S. NASH

Lapping the field

These *Premier 100* companies boast the biggest lead over their industry peers in the Information Productivity Index

	Transportation	Rank
COMPANY	Illinois Central Corp.	2
CLOSEST RIVAL	American President Cos.	44
	Soaps and cosmetics	
COMPANY	International Flavors & Fragrances, Inc.	15
CLOSEST RIVAL	Avon Products, Inc.	98
	Farm equipment	
COMPANY	Briggs & Stratton Corp.	28
CLOSEST RIVAL	Stewart & Stevenson Services	91
	Beverages	
COMPANY	Coca Cola Co.	33
CLOSEST RIVAL	Whitman Corp.	106
	Publishing and printing	
COMPANY	Gannett Co.	37
CLOSEST RIVAL	Tribune Co.	92
	Life insurance	
COMPANY	IDS Financial Corp.	73
CLOSEST RIVAL	None in Top 230 companies	NA

When it comes to those great smells that remind you of a new car, a pine tree or a fun summer at the beach, International Flavors & Fragrances, Inc. (IFF) stands out from its competitors. With more than 80,000 recipes on file, IFF is the world's leader in the synthetic taste and smell market.

The company is also notable for finishing far ahead of its industry brethren in information systems effectiveness using the *Premier 100*'s Information Productivity Index.

Information productivity, used to rank the *Premier 100*, rewards companies that achieve a high level of productivity for low overhead or management cost, or those that do more with less. This year, IFF and five other highfliers finished well ahead of their industry peers in information productivity rankings. The others include publisher Gannett Co., financial firm IDS Financial Corp., transportation company Illinois Central Corp., heavy manufacturer Briggs & Stratton Corp. and Coca Cola Co. The latter two declined interviews, citing state secrets.

Without exception, every IS scheme these companies hatch is predicated on knowing and serving clients better. But they also emphasize tangible bottom-line benefits from IS spending.

Wariness of investing in the unproved is indicated by a rather blase view of client/server at these firms. Briggs & Stratton allocates about 20% of its new software development to client/server, while Illinois Central says it devotes just 10%.

SECRETS OF SUCCESS

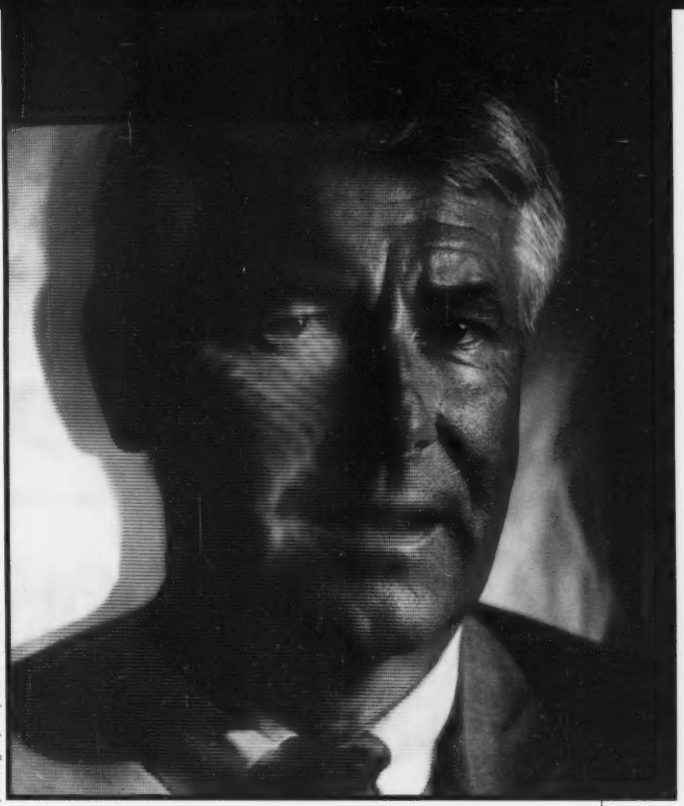
Consider some other traits shared by these best of the best in IS.

■ **Close to the customer.** At IFF and Gannett, IS actually lives at business units. Gannett employs systems managers at each of more than 160 newspaper offices and TV stations nationwide. IFF experimented last year with relocating application developers, business modelers and other technicians to individual user departments.

The move shook people up — for the better, says IS director Wim van Berkel. IS learned what sales, marketing and engineering does and vice versa.

That doesn't mean IFF's 57-member IS staff knows how to bind polymers to create the perfect cheddar flavor for a new cheese-like product. But IS must understand how the salesperson who sells that flavor works and what the clients need to know when, van Berkel says. "We've made it very clear to people that that's their charter."

■ **Customer service, customer service, customer service.** Like a caffeine addict around



photograph by NEIL SELKIRK

IFF'S WIM VAN BERKEL says IS must understand how salespeople at the company work

fine Brazilian coffee, Carl Beihl, vice president of strategic technology planning at IDS, obsesses about catering to the customer. "Previously, we were organized around products — mutual funds, policies, that kind of thing," he says. "Now we're focused around market groups — who's buying what and how we can help them buy more."

IDS plans to roll out early next year new client management software to its nationwide sales force.

But more important are the regular meetings software developers have with field sales, says Alan Bidnall, IDS' vice president of financial planning. Bidnall and other business managers meet with IS folks each quarter to refine technology projects in progress and in planning.

With 11 years in IS before assuming his current role in 1990, Bidnall says the process is simple. "We look at what our competitors are doing and what we want to do, then IS goes off and figures out the technology to make it happen."

Sometimes the two sides disagree on how to reach goals, "but the clash is part of the coming together," Bidnall adds.

At some firms, electronic data interchange is becoming synonymous with customer service, says IFF's van Berkel. IFF is considering setting up terminals at customer sites next year, and Milwaukee-based engine and lock maker Briggs & Stratton may also link to suppliers in that manner.

■ **Outsourcing is not a dirty word anymore.** While it used to be a scary, expensive, all-or-nothing deal, outsourcing has been whittled down to a tool that can be controlled by IS. Such selective outsourcing can be like a surgeon's knife, says Geoffrey Barnes, a consultant at Cap Gemini America, Inc.'s Atlanta office. Applied thoughtfully and precisely, outsourcing is a way to "cut away the painful parts of your job to promote growth," he says.

Illinois Central recently farmed out its core transportation systems to the Union Pacific Technology unit of Union Pacific Railroad. Illinois Central plans to redeploy internal IS to rebuild and "client/server-ize" financial systems, says Norman Schwarz, director of technical network support.

■ **ROI is king.** One issue that unifies the *Premier 100* star performers is a focus on cost justification. Asked on the *Premier 100* survey to rate the importance of return on investment (ROI) in justifying IS investments, nearly every company deemed it "extremely important."

ROI "is the only way we go," IDS' Bidnall says. But the firm allows strategic projects more breathing room as far as showing bottom-line returns, he says. However, quick hit efforts, such as setting up a temporary forecasting system, need to prove their value almost immediately, he says.

Likewise, each and every project at Gannett is looked at first for its ROI, says John Palm, IS director at the Arlington, Va.-based company. Gannett recently installed a graphical decision support application to help advertising marketers better target their efforts. Palm wouldn't specify how much money the media chain has seen in new sales related to the application, but he says the project will continue: "We're putting a lot more money into it next year, let's just say." □

Nash is a Computerworld *West Coast senior editor.*

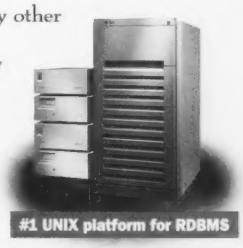


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11. President, Owner/Partner, General Manager
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

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Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

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❒ Yes ❒ No

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Commentary

How we evaluated productivity

PAUL STRASSMANN

Twenty years of experience as a CIO trying to explain budget increases to corporate executives has taught me that our traditional means of evaluating productivity don't work. In this issue, you'll find criteria that do.

This year's listing of *Computerworld Premier 100* companies was compiled based on my own Information Productivity Index.

Information Productivity measures and rewards the effectiveness of corporate management. It does not reward the more common metrics of information technology spending, such as computer budget, the value of installed equipment or other measures of brute force. That is because there is no demonstrable correlation between the financial performance of a firm and the amount it spends on information technologies. What matters is not how much you spend but how well you spend it in supporting business missions and contributing to productivity.

The old justification methods don't work because they rely on ratios that measure the efficiency of capital. These indicators have such names as return on assets, return on investment and return on equity. But in modern enterprises, capital doesn't mean as much as it used to. The performance of high technology and service businesses are influenced more by the quality of their management than by their assets.

Productivity is the ratio of output to input. Unfortunately, there's no place for management's output on an income statement. But there is a way to calculate it. If you subtract from after-tax profits the value of the shareholder's equity capital, what's left is the value of management.

Technology isn't productive in itself. But well-managed, superbly trained and motivated people — with or without computers — can show measurable gains in output.

Input of management is the cost of the coordination of an enterprise, frequently defined as either overhead or indirect costs.

These definitions of output and input reject conventional productivity measures. For example, revenue is not a measure of output because it includes value added by suppliers. Profits are not an acceptable measure of performance because they don't include compensation to shareholders. Costs — especially costs per employee — are misleading indicators of input because they include the value of purchases. The value of assets is irrelevant as a measure of input because leasing and outsourcing distort that statistic.

Recent improvements in financial reporting and the availability of detailed financial information have made it possible to calculate a reasonable return on management. For output, I use Stern, Stewart & Co.'s popular Economic Value-Added (EVA). If EVA is not available, output can be calculated by subtracting from operating profit after taxes the value of shareholder equity, multiplied by the cost of capital.

The costs of sales, general and administration (SG&A) are a reasonable approximation of management costs. Divide EVA by SG&A to get the Information Productivity Index.

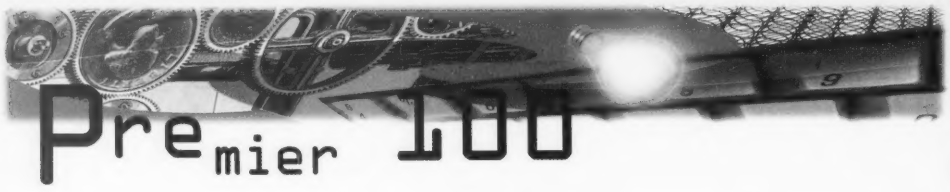
The *Computerworld Premier 100* rankings have been calculated using published 1993 financial results for the Fortune 1,000. Because some firms show wide swings in year-to-year profits, our rankings also considered three-year averages. Firms that reported favorable operating profits after taxes but also large accounting write-offs, which made their shareholder equity negative, were eliminated from consideration.

Because Information Productivity relates to the numbers that are watched and understood by your board of directors, your top executives and your shareholders, this year's *Computerworld Premier 100* rankings offer a sound basis from which to start discussions on how to do better next year. □

Strassmann is a consultant and former CIO of Kraft Corp., General Foods Corp., Xerox Corp. and the U.S. Department of Defense.



There is no demonstrable correlation between the financial performance of a firm and the amount it spends on information technologies.



Premier 100

PREMIER 100 RANK	COMPANY	INDUSTRY	INFORMATION PRODUCTIVITY INDEX	CIO'S YEARS IN POSITION	CIO REPORTS TO
1	**Unifi, Inc.**	Textiles	1.81	12	Executive Vice President, Finance
2	**Illinois Central Corp.**	Transportation	1.35	4	President & CEO
3	**Ambac, Inc.***	Financial Services	1.25	1	CEO
4	**ARA Group, Inc.**	Diversified Services	1.08	12	Senior Vice President, Finance & HR
5	**UST, Inc.***	Tobacco	1.05	NA	NA
6	**Fluor Corp.**	Diversified Services	.95	3	Group President
7	**MAPCO, Inc.**	Petroleum Refining	.82	1	Senior Vice President & CFO
8	**MBIA, Inc.**	Financial Services	.78	1	Controller & Senior Vice President
9	**U.S. Healthcare, Inc.**	Diversified Services	.74	5	Chief Marketing Officer & COO
10	**Amgen, Inc.**	Pharmaceuticals	.71	4.5	Senior Vice President, Operations
11	**Newmont Mining Corp.**	Gold Mining	.6	2.5	Senior Vice President, Operations
12	**Cooper Tire & Rubber Co.**	Plastic Products	.58	2	President & COO
13	**Great Lakes Chemical Corp.**	Chemicals	.52	8	Executive Vice President & CFO
14	**Abbott Laboratories***	Pharmaceuticals	.5	NA	NA
15	**International Flavors & Fragrances, Inc.**	Soaps & Cosmetics	.49	18	President
16	**The Bear Stearns Cos.**	Financial Services	.43	7	COO & CFO
17	**Walt Disney Co.**	Diversified Services	.41	5	CFO
18	**CSF Holdings, Inc.***	Savings Banks	.41	8	Vice President, Finance
19	**Ace Hardware Corp.**	Diversified Services	.4	5	Executive Vice President & COO
20	**Waste Management, Inc.**	Diversified Services	.38	0.25	CFO
21	**Collective Bancorp, Inc.**	Savings Banks	.37	3	Vice Chairman
22	**Schering-Plough Corp.***	Pharmaceuticals	.36	6	Executive Vice President
23	**Fruit of the Loom, Inc.***	Apparel	.36	NA	NA
24	**Morgan Stanley Group, Inc.***	Financial Services	.35	1	Senior Vice President
25	**American Home Products Corp.**	Pharmaceuticals	.34	3	Executive Vice President

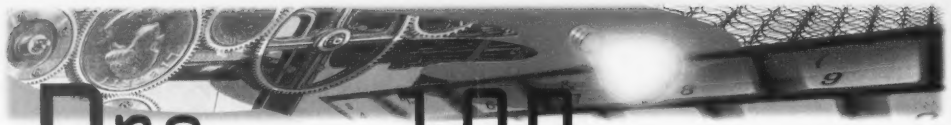
***Data not from the top executive at the company**

Note: Information Productivity Index=[(Profit before taxes-provision for income taxes)-cost of capital] / [Selling, general & administrative expense] Higher numbers indicate superior productivity



TOTAL NUMBER OF EMPLOYEES	TOTAL NUMBER OF IS STAFF (RANGE)	TOTAL IS BUDGET (RANGE)	PERCENT CHANGE IN BUDGET '93-'94	PERCENT IS BUDGET SPENT OUTSIDE IS DEPARTMENT	PERCENT SOFTWARE SPENT ON NEW DEVELOPMENT	PERCENT SOFTWARE DEVELOPMENT FOR CLIENT/SERVER	PERCENT SOFTWARE DEVELOPMENT FOR MAINTENANCE	TOTAL DESKTOP SERVERS (RANGE)	PERCENT OF DESKTOP DEVICES NETWORKED
5,177	<100	$5M-$9.9M	22%	15%	65%	28%	NA	250-499	19%
3,219	<100	$5M-$9.9M	-0.6%	5%	16%	11%	84%	500-999	21%
300	<100	$25M-$49.9M	NA	NA	NA	NA	NA	1,000-2,499	NA
135,400	250-499	$25M-$49.9M	2.5%	15%	60%	40%	40%	>10,000	15%
3,724	100-249	$25M-$49.9M	NA	NA	NA	NA	40%	1,000-2,499	NA
43,000	500-999	$100M-$249.9M	0%	5%	30%	10%	70%	1,000-2,499	95%
6,313	<100	$10M-$24.9M	NA	20%	40%	10%	60%	1,000-2,499	70%
350	<100	$1M-$4.9M	17.5%	NA	90%	33%	10%	250-499	100%
3,800	250-499	$50M-$99.9M	18%	65%	65%	80%	35%	2,500-4,999	95%
3,807	100-249	$25M-$49.9M	NA	12%	60%	15%	40%	2,500-4,999	95%
2,393	<100	$1M-$4.9M	13%	2%	30%	25%	70%	500-999	90%
7,500	100-249	$10M-$24.9M	7%	10%	60%	25%	40%	1,000-2,499	75%
7,000	100-249	$10M-$24.9M	0%	10%	35%	10%	65%	1,000-2,499	75%
49,659	1,000-2,499	$250M-$499.9M	10%	NA	NA	NA	NA	5,000-9,999	NA
4,300	100-249	$25M-$49.9M	-3%	17%	90%	85%	10%	1,000-2,499	100%
7,321	500-999	$100M-$249.9M	23%	6%	57%	43%	43%	>10,000	97%
62,000	1,000-2,499	$250M-$499.9M	1%	5%	65%	35%	35%	>10,000	95%
620	<100	$25M-$49.9M	0%	50%	75%	70%	25%	1,000-2,499	30%
3,718	100-249	$10M-$24.9M	9%	0%	60%	10%	40%	1,000-2,499	80%
35,979	250-499	$50M-$99.9M	-26%	50%	20%	1%	80%	>10,000	78%
1,050	<100	$1M-$4.9M	0%	0%	10%	100%	90%	1,000-2,499	90%
21,600	500-999	$50M-$99.9M	5%	10%	55%	75%	45%	2,500-4,999	75%
35,000	<100	$50M-$99.9M	NA	NA	NA	NA	NA	1,000-2,499	NA
9,025	<100	$1M-$4.9M	-20%	10%	75%	50%	25%	1,000-2,499	100%
50,000	1,000-2,499	$100M-$249.9M	10%	10%	10%	80%	80%	2,500-4,999	65%

Illustrations by M.A.D.



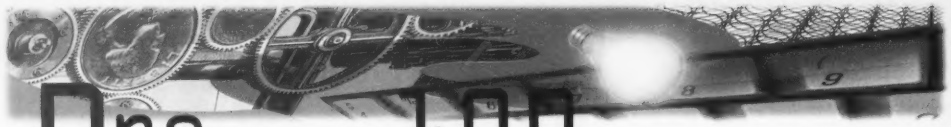
Premier 100

PREMIER 100 RANK	COMPANY	INDUSTRY	INFORMATION PRODUCTIVITY INDEX	CIO'S YEARS IN POSITION	CIO REPORTS TO
26	**Cone Mills Corp.***	Textiles	.33	3	Vice President, Finance
27	**Merck & Co.**	Pharmaceuticals	.33	2	Senior Vice President
28	**Briggs & Stratton Corp.**	Farm Equipment	.33	19	Executive Vice President, Administration
29	**Merrill Lynch & Co.**	Financial Services	.32	3.5	Chairman & CEO
30	**Boston BanCorp***	Savings Banks	.32	1	CEO
31	**Sunbeam-Oster Co.***	Electronics	.3	0	CFO
32	**Salomon Brothers, Inc.**	Financial Services	.29	3	Managing Director of Exec. Committee
33	**Coca Cola Co.***	Beverages	.29	3	Controller
34	**Bristol-Myers Squibb Co.***	Pharmaceuticals	.29	3	CFO
35	**Praxair, Inc.**	Chemicals	.29	0.5	CFO
36	**Charles Schwab Corp.**	Financial Services	.29	1	President
37	**Gannett Co.***	Publishing & Printing	.28	12	CFO
38	**GEICO Corp.**	Financial Services	.26	1	CEO
39	**Levi Strauss Associates, Inc.**	Apparel	.25	9	COO
40	**Dibrell Brothers, Inc.**	Tobacco	.24	25	Senior Vice President & CFO
41	**Gerber Products Co.**	Food	.24	10	CFO
42	**Rubbermaid, Inc.***	Plastic Products	.24	NA	NA
43	**Medtronic, Inc.**	Photographic Equipment	.23	15	Senior Vice President & CFO
44	**American President Cos.**	Transportation	.23	7	Chairman, CEO & President
45	**H&R Block, Inc.**	Diversified Services	.22	1	President & CEO
46	**Raytheon Co.***	Electronics	.22	3	Vice President, Engineering
47	**Kellogg Co.***	Food	.21	12	Vice President
48	**Worthington Industries, Inc.**	Metals	.21	1	Vice President, Engineering
49	**United Healthcare Corp.**	Diversified Services	.21	5	CEO
50	**W. M. Wrigley Jr. Co.***	Food	.2	2	Vice President, Finance

***Data not from the top executive at the company**



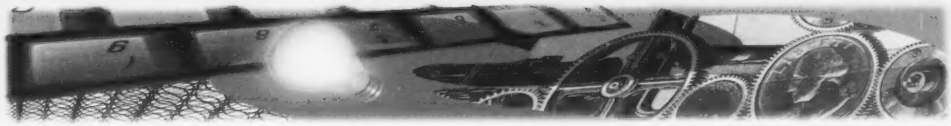
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7,800	250-499	$25M-$49.9M	0%	1%	40%	5%	60%	2,500-4,999	90%
18,172	500-999	$100M-$249.9M	9%	10%	65%	80%	35%	1,000-2,499	80%
7,950	<100	$5M-$9.9M	4%	20%	25%	20%	75%	500-999	40%
42,650	2,500-4,999	>$500M	7%	0%	60%	70%	40%	2,500-4,999	90%
210	<100	$1M-$4.9M	NA	20%	0%	99%	100%	100-249	100%
10,500	500-999	$1M-$4.9M	80%	0%	40%	95%	60%	1,000-2,499	100%
8,629	1,000-2,499	$100M-$249.9M	-2%	50%	35%	100%	65%	5,000-9,999	99%
34,000	100-249	$100M-$249.9M	0%	25%	60%	50%	40%	5,000-9,999	50%
49,500	1,000-2,499	$100M-$249.9M	-10%	5%	40%	30%	60%	>10,000	70%
16,766	100-249	$10M-$24.9M	-20%	25%	50%	75%	50%	2,500-4,999	95%
6,100	500-999	$100M-$249.9M	12%	25%	80%	85%	20%	5,000-9,999	90%
36,000	500-999	$50M-$99.9M	5%	0%	40%	20%	60%	>10,000	30%
8,350	500-999	$25M-$49.9M	4%	12.5%	58%	15%	42%	5,000-9,999	98%
36,400	500-999	$50M-$99.9M	78%	NA	90%	50%	10%	5,000-9,999	100%
4,600	<100	$1M-$4.9M	-10%	12%	60%	80%	40%	100-249	25%
9,280	100-249	$10M-$24.9M	11%	30%	80%	30%	NA	1,000-2,499	50%
11,978	100-249	$50M-$99.9M	3%	NA	NA	NA	NA	2,500-4,999	NA
9,856	100-249	$25M-$49.9M	8%	NA	65%	25%	35%	2,500-4,999	90%
4,655	250-499	$100M-$249.9M	13%	37%	60%	90%	40%	2,500-4,999	80%
81,000	250-499	$10M-$24.9M	15%	75%	60%	5%	40%	>10,000	2%
63,800	>10,000	$25M-$49.9M	7%	30%	30%	70%	70%	>10,000	85%
16,151	500-999	$250M-$499.9M	7%	15%	30%	15%	70%	>10,000	35%
7,000	<100	$5M-$9.9M	50%	60%	20%	0%	80%	1,000-2,499	80%
7,772	500-999	$100M-$249.9M	22%	NA	40%	30%	60%	5,000-9,999	98%
6,700	100-249	$10M-$24.9M	10%	20%	50%	10%	50%	500-999	50%



Premier 100

PREMIER 100 RANK	COMPANY	INDUSTRY	INFORMATION PRODUCTIVITY INDEX	CIO'S YEARS IN POSITION	CIO REPORTS TO
51	**Johnson & Johnson***	Pharmaceuticals	.19	4	Chairman & CEO
52	**Newell Co.***	Metal Products	.19	1	Treasurer
53	**NALCO Chemical Co.**	Chemicals	.19	3.5	Senior Vice President, Mfg. & Logistics
54	**Lancaster Colony Corp.***	Food	.19	4	Vice President, Finance
55	**E-Systems, Inc.***	Electronics	.19	6	Vice President, Finance
56	**Nike, Inc.***	Diversified Services	.19	0	Vice President, Operations
57	**Advanta Corp.**	Financial Services	.18	0.5	Senior Vice President, Corporate Admin.
58	**Southwestern Bell Corp.**	Utilities	.18	2.5	President, Network Services
59	**Travelers Corp.**	Financial Services	.18	4	Chief Administration Officer
60	**Charter One Financial, Inc.***	Savings Banks	.18	4	Senior Vice President, Operations
61	**Gap, Inc.**	Retailing	.17	4.5	CFO
62	**Valspar Corp.***	Chemicals	.17	1	President
63	**Bankers Trust New York Corp.**	Commercial Banks	.16	10	President
64	**McDonald's Corp.**	Retailing	.16	11	Executive Vice President
65	**Reebok International Ltd.**	Diversified Services	.16	3	Executive Vice President, Operations
66	**First Commerce Corp.***	Commercial Banks	.16	3	Executive Vice President
67	**Sigma Aldrich Co.***	Chemicals	.16	15	President
68	**Thiokol Corp.**	Aerospace	.16	3.5	Senior Vice President, Finance & CFO
69	**JP Morgan & Co.***	Commercial Banks	.15	3	Managing Director
70	**Rockwell International Corp.**	Electronics	.15	11	Senior Vice President
71	**Emerson Electric Co.**	Electronics	.15	2	Executive Vice President
72	**CPC International, Inc.***	Food	.15	12	Vice President, Administration
73	**IDS Financial Corp.***	Life Insurance	.15	26	CEO
74	**H. J. Heinz Co.***	Food	.15	2	Vice President, Finance
75	**3M Co.**	Photographic Equipment	.15	2	Vice President, Logistics

***Data not from the top executive at the company**



TOTAL NUMBER OF EMPLOYEES	TOTAL NUMBER OF IS STAFF (RANGE)	TOTAL IS BUDGET (RANGE)	PERCENT CHANGE IN BUDGET '93-'94	PERCENT IS BUDGET SPENT OUTSIDE IS DEPARTMENT	PERCENT SOFTWARE SPENT ON NEW DEVELOPMENT	PERCENT SOFTWARE DEVELOPMENT FOR CLIENT/SERVER	PERCENT SOFTWARE DEVELOPMENT FOR MAINTENANCE	TOTAL DESKTOP SERVERS (RANGE)	PERCENT OF DESKTOP DEVICES NETWORKED
81,600	1,000-2,499	$100M-$249.9M	-10%	NA	40%	75%	60%	>10,000	100%
15,000	<100	$10M-$24.9M	3%	10%	30%	5%	70%	1,000-2,499	40%
6,998	100-249	$10M-$24.9M	2%	23%	75%	25%	25%	2,500-4,999	95%
5,000	<100	$1M-$4.9M	5%	10%	50%	5%	50%	100-249	10%
16,703	<100	$50M-$99.9M	5%	50%	100%	5%	0%	5,000-9,999	75%
5,000	250-499	$10M-$24.9M	0%	20%	80%	40%	20%	5,000-9,999	100%
1,600	100-249	$5M-$9.9M	29%	63%	50%	10%	50%	1,000-2,499	100%
61,230	1,000-2,499	$250M-$499.9M	10%	1.5%	20%	70%	80%	>10,000	90%
60,000	2,500-4,999	>$500M	50%	40%	NA	NA	NA	>10,000	85%
1,600	<100	$10M-$24.9M	NA	NA	NA	NA	NA	1,000-2,499	NA
40,000	250-499	$50M-$99.9M	20%	0%	65%	8%	15%	2,500-4,999	92%
2,513	<100	$25M-$49.9M	-15%	5%	5%	50%	95%	500-999	50%
13,000	1,000-2,499	>$500M	18%	0%	65%	80%	20%	>10,000	85%
167,000	500-999	$50M-$99.9M	-1%	20%	75%	20%	25%	1,000-2,499	100%
4,300	250-499	$50M-$99.9M	18%	2.5%	65%	70%	35%	1,000-2,499	100%
3,500	<100	$25M-$49.9M	0%	NA	50%	25%	50%	1,000-2,499	90%
4,291	<100	$10M-$24.9M	22%	NA	NA	25%	NA	1,000-2,499	5%
8,982	250-499	$25M-$49.9M	-6%	5%	86%	60%	14%	>10,000	98%
15,000	250-499	$100M-$249.9M	20%	20%	70%	30%	30%	1,000-2,499	100%
75,000	1,000-2,499	$250M-$499.9M	-2%	25%	50%	15%	50%	>10,000	85%
71,600	500-999	$100M-$249.9M	0%	NA	NA	NA	NA	>10,000	NA
38,924	250-499	$100M-$249.9M	4%	NA	40%	40%	60%	5,000-9,999	50%
8,371	500-999	$100M-$249.9M	15%	20%	60%	30%	40%	>10,000	40%
37,700	500-999	$100M-$249.9M	15%	20%	60%	30%	40%	>10,000	40%
85,650	2,500-4,999	$250M-$499.9M	2%	50%	82%	75%	18%	5,000-9,999	95%



Premier 100

PREMIER 100 RANK	COMPANY	INDUSTRY	INFORMATION PRODUCTIVITY INDEX	CIO'S YEARS IN POSITION	CIO REPORTS TO
76	**Fifth Third Bancorp***	Commercial Banks	.15	0.3	CEO
77	**Ameritech Corp.**	Utilities	.15	1.3	President, Network Services
78	**Rhone Poulenc Rorer, Inc.***	Pharmaceuticals	.14	5	CFO
79	**General Mills, Inc.***	Food	.14	5	Corporate Comtroller
80	**PaineWebber Group, Inc.**	Financial Services	.14	5	Chief Administration Officer
81	**Turner Corp.**	Diversified Services	.14	1	Senior Vice President, Board of Dir.
82	**Hon Industries, Inc.***	Furniture	.14	15	President
83	**MBNA Corp.**	Commercial Banks	.14	3	Chairman of the Board & CEO
84	**General RE Corp.***	Financial Services	.14	17	President
85	**First Virginia Banks, Inc.**	Commercial Banks	.13	8	Chairman & CEO
86	**Allergan, Inc.***	Pharmaceuticals	.13	12	CIO
87	**Leggett & Platt, Inc.**	Furniture	.13	20	Senior Vice President, Finance & Admin.
88	**May Department Stores Co.***	Retailing	.13	12	President
89	**Hershey Foods Corp.**	Food	.12	15	Vice President, Finance & Administration
90	**Hillenbrand Industries, Inc.**	Metal Products	.12	5	Vice President & Controller
91	**Stewart & Stevenson Services***	Farm Equipment	.12	21	Corporate Comtroller
92	**Tribune Co.**	Publishing & Printing	.12	5	Chairman & CEO
93	**Reader's Digest Association, Inc.**	Publishing & Printing	.12	3	COO/CEO
94	**Wal-Mart Stores, Inc.**	Retailing	.12	1	COO
95	**Sonoco Products Co.**	Forest Products	.11	4	Executive Vice President
96	**Gillette Co.**	Metal Products	.11	1.5	CFO
97	**Werner Enterprises, Inc.**	Transportation	.11	1	Vice President
98	**Avon Products, Inc.***	Soaps & Cosmetics	.11	7	COO
99	**Dover Corp.***	Farm Equipment	.11	14	Vice President, Finance
100	**Upjohn Co.**	Pharmaceuticals	.11	8	Corp. Executive Vice President, Admin.

***Data not from the top executive at the company**



TOTAL NUMBER OF EMPLOYEES	TOTAL NUMBER OF IS STAFF (RANGE)	TOTAL IS BUDGET (RANGE)	PERCENT CHANGE IN BUDGET '93-'94	PERCENT IS BUDGET SPENT OUTSIDE IS DEPARTMENT	PERCENT SOFTWARE SPENT ON NEW DEVELOPMENT	PERCENT SOFTWARE DEVELOPMENT FOR CLIENT/SERVER	PERCENT SOFTWARE DEVELOPMENT FOR MAINTENANCE	TOTAL DESKTOP SERVERS (RANGE)	PERCENT OF DESKTOP DEVICES NETWORKED
4,938	250-499	$5M-$9.9M	15%	NA	NA	NA	NA	2,500-4,999	NA
66,956	2,500-4,999	>$500M	0%	2%	30%	18%	70%	>10,000	90%
22,500	250-499	$10M-$24.9M	0%	5%	35%	30%	65%	250-499	95%
121,290	250-499	$.5M-$999,999	10%	NA	NA	NA	NA	2,500-4,999	NA
13,000	500-999	$100M-$249.9M	12%	15%	75%	80%	25%	>10,000	92%
2,445	<100	$1M-$4.9M	-17%	50%	40%	NA	60%	1,000-2,499	80%
5,691	100-249	$10M-$24.9M	10%	0%	20%	10%	80%	1,000-2,499	100%
9,868	1,000-2,499	$50M-$99.9M	87%	19%	61%	15%	39%	5,000-9,999	85%
2,400	250-499	$25M-$49.9M	0%	0%	85%	100%	15%	1,000-2,499	20%
5,400	100-249	$25M-$49.9M	8%	0%	35%	5%	65%	<100	100%
4,749	100-249	$10M-$24.9M	NA	40%	70%	60%	40%	1,000-2,499	80%
4,000	<100	$5M-$9.9M	8%	10%	60%	10%	40%	500-999	2%
140,000	500-999	$50M-$99.9M	0%	10%	40%	5%	60%	>10,000	25%
15,300	100-249	$10M-$24.9M	15%	36%	60%	5%	40%	1,000-2,499	90%
10,200	100-249	>$500M	5%	5%	NA	20%	100%	100-249	100%
2,850	<100	$1M-$4.9M	20%	0%	NA	1%	NA	NA	NA
9,862	<100	$10M-$24.9M	1%	5%	25%	20%	25%	5,000-9,999	25%
7,200	250-499	$50M-$99.9M	0%	1%	64%	34%	36%	5,000-9,999	98%
540,000	1,000-2,499	$250M-$499.9M	15%	1%	85%	95%	15%	>10,000	100%
18,000	<100	$10M-$24.9M	2%	18%	70%	35%	30%	1,000-2,499	70%
33,400	250-499	$100M-$249.9M	13%	20%	70%	80%	30%	>10,000	35%
3,845	<100	$5M-$9.9M	50%	25%	75%	10%	25%	100-249	75%
29,800	500-999	$50M-$99.9M	8%	75%	75%	10%	25%	5,000-9,999	25%
20,445	<10	$5M-$9.9M	5%	20%	50%	85%	50%	250-499	80%
18,600	500-999	$100M-$249.9M	-5%	50%	66%	40%	34%	5,000-9,999	90%

A list of **PREMIER 100** companies, top IS executives and page references. Page numbers refer to the first page of the article(s) in which the company is mentioned.

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3M Co., David P. Drew, V. P., IT, **50**
Abbott Laboratories, Kenneth Farmer, V. P., Corporate MIS, **46**
Ace Hardware Corp., Don Schuman, V. P., IS, **10,46**
Advanta Corp., Dan Muecke, V. P., Corporate Tech., **50**
Allergan, Inc., Mike Lach, V. P., Info. Svcs., **52**
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American Home Products Corp., Edward A. Schefer, V. P., MIS, **46**
American President Cos., James S. Marston, Sr. V. P. and CIO, **34,48**
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Bristol-Myers Squibb Co., Alex J. Gibbons, V. P., **48**
Charles Schwab Corp., Dawn LePore, CIO and Exec. V. P., **48**
Charter One Financial, Inc., Marc Reider, Projects Assistant, **50**
Coca Cola Co., Hugh Switzer, V. P. and Director, Info. Svcs., **40,48**
Collective Bancorp, Inc., Eric Gaupp, V. P., Systems, **46**
Cone Mills Corp., Paul Vetter, Director, Info. Svcs., **48**
Cooper Tire & Rubber Co., John E. Mitchell, Director, IS, **10,46**
CPC International, Inc., Angelo Abdela, V. P. and Treasurer, **50**
CSF Holdings, Inc., Jack Butler, Sr. V. P., MIS, **46**
Dibrell Brothers, Inc., Lewis R. Handy, V. P. and Director, MIS, **48**
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Emerson Electric Co., S. Lamar Rieves, V. P., IS, **50**
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First Commerce Corp., James Granier, Sr. V. P., IS, **50**
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GEICO Corp., Simone J. Pace, CIO and Sr. V. P., **48**
General Mills, Inc., Phil Semmer, CIO, **52**
General RE Corp., Stephen Raye, CIO, **52**
Gerber Products Co., John Kraley, Director, Corporate MIS, **48**
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H&R Block, Inc., Judy Keisling, V. P., Info. Svcs., **48**
H. J. Heinz Co., Jerry Havemann, General Mgr., IS, **50**
Hershey Foods Corp., Bruce Dieffenbach, Director, Info. Svcs., **20,52**
Hillenbrand Industries, Inc., Colin Goodnight, Mgr., Corporate MIS, **52**
Hon Industries, Inc., Jim Goughenour, V. P., Process Improvement and Technology, **52**
IDS Financial Corp., Jack Thomas, Sr. V. P., Info. & Tech., **40,50**
Illinois Central Corp., Dale W. Phillips, V. P. and CFO, **17,40,46**
International Flavors & Fragrances, Inc., Wim Van Berkel, V. P., IT, **40,46**
Johnson & Johnson, Ronald Morris, V. P., IT, **50**
JP Morgan & Co., James Brennan, V. P., Software Development, **50**
Kellogg Co., Jay W. Shreiner, V. P., Info. Svcs., **48**
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Leggett & Platt, Inc., Don LaFerla, V. P., Mgmt., Info. and Office Svcs., **52**
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Newmont Mining Corp., Jean-Michael Rendu, V. P., Mine Engineering and IS, **46**
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PaineWebber Group, Inc., Robert McKinney, CIO, **52**
Praxair, Inc., Tom Mantz, CIO, **48**
Raytheon Co., Bob Turcotte, **48**
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Reebok International Ltd., Tom Trainer, CIO and V. P., **50**
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Rubbermaid, Inc., Michael Naylor, Sr. V. P., Technology, **48**
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Schering-Plough Corp., Robert S. Lyons, V. P., **46**
Sigma Aldrich Co., Alan M. Jaggie, V. P., Info. Svcs., **50**
Sonoco Products Co., Bernie Campbell, V. P., IS, **20,26,52**
Southwestern Bell Corp., Richard Deitz, V. P., Info. Svcs., **50**
Stewart & Stevenson Services, Ernie Trozzo, Director, MIS, **52**
Sunbeam-Oster Co., Robert Gaynor, Director, MIS, **48**
Thiokol Corp., Brad Stout, CIO and V. P., IS, **26,50**
Travelers Corp., Richard E. Morrison, Sr. V. P. and CIO, **50**
Tribune Co., John Kazik, Sr. V. P., IS, **10,38,52**
Turner Corp., David Furth, Manager, IS, **52**
U.S. Healthcare, Inc., Richard Castor, CIO and V. P., **17,46**
Unifi, Inc., Jerry Moore, V. P., MIS, **10,13,26,46**
United Healthcare Corp., James P. Bradley, CIO and Sr. V. P., **34,48**
Upjohn Co., Jack Longman, V. P., MI and OS, **52**
UST, Inc., Donald Cerullo, V. P., Corporate MIS, **17,46**
Valspar Corp., Jim Johnson, Director, MIS, **50**
W. M. Wrigley Jr. Co., Dennis Mally, Director, Info. Svcs., **48**
Wal-Mart Stores, Inc., Randall Mott, CIO and Sr. V. P., **52**
Walt Disney Co., Sharon Garrett, CIO, **46**
Waste Management, Inc., Bert Young, V. P., IS, **8,46**
Werner Enterprises, Inc., Kirk Hooten, Director, MIS, **52**
Worthington Industries, Inc., Bill Miller, Mgr., Corporate IS, **48**

Comment

Lessons of the productivity paradox

Emotions run high at the mere mention of the fabled productivity paradox. Just the hint that computers haven't delivered their long-promised payback has sent shock waves up and down high-tech America.

And with good reason. Such a profound challenge goes right to the heart of the supposed miracles of information technology.

It must be a measurement problem, the critics say. Surely technology has always been of great value but undoubtedly in ways that are escaping the U.S. government's economic accounting system. Fix the metrics, and presto! The paradox would vanish.

That, in fact, was a key conclusion of a three-year study conducted under the auspices of the National Academy of Sciences and recently published in a volume entitled *Information Technology and the Service Society: A Twenty-First Century Lever*. As a member of the committee that produced this tome, I can attest to the fact that the measurement critique found many a sympathetic ear in our debates.

STEPHEN ROACH

In its simplest form, the paradox went like this: America's vast service sector — industries such as banks, airlines, telecommunications and retail that collectively own about 85% of the nation's installed base of information technology — was stuck in a quagmire of disappointing productivity growth.

In the 1980s, this segment of the economy upped the ante on technology, spending an additional $860 billion on hardware alone. At the same time, however, service sector productivity failed to respond, continuing to increase at an anemic 0.7% average annual rate. The widely presumed benefits of the Information Age were starting to ring hollow.

From the beginning, I never felt this was a statistical fluke. Yes, the measurement pitfalls of gauging service sector output are legendary. But something more powerful was at work. Sheltered from competition by regulation and the lack of foreign players, service companies were becoming more complacent about matters of cost control and were loading up on both workers and machines.

The result was a bad case of bloated costs, highlighted by a rapidly growing infrastructure of unproductive information technology.

The moment of truth came with a sea change in the competitive environment. Triggered by deregulation and globalization, a massive wave of service sector restructuring began in the early 1990s, sparking unprecedented upheaval in America's technology user community. The harsh reality of service sector restructuring suggests there was something to the paradox all along.

But that was then. Courtesy of restructuring, America is beginning to move to the other side of its technology quandary. As service industries scramble to survive in today's competitive climate, they are finally using information technologies as strategic tools for competitive advantage.

Moreover, salespeople are being empowered with potent point-of-sale computing devices, enabling them to participate in higher-value activities such as inventory control and customer feedback. Additionally, a whole layer of midlevel, paper-shuffling managers is being replaced by the combination of global telecommunications networks and on-line transaction tracking systems.

And so the saga comes full circle. The paradox served the very useful purpose of signaling that something was amiss as America leapt headlong into the Information Age.

But now managers are left with the arduous task of resolving the paradox. That means adopting technology-based strategies aimed at flattening corporate bureaucracies, restoring flexibility to cost structures and providing the long-awaited boost to white-collar productivity. Let memories of the paradox endure, however, as a warning of how easy it is to stray from the path. □

Roach is co-director of global economics at Morgan Stanley & Co.



The [productivity] paradox served the very useful purpose of signaling that something was amiss as America leapt headlong into the Information Age.

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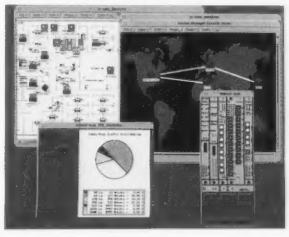
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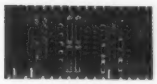
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